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THE
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OF
MEDICINE AND SURGERY

BEING

A Yearly Digest of Scientific Progress and Authoritative
Opinion in all Branches of Medicine and Surgery,
drawn from Journals, Monographs, and Text-
Books, of the Leading American and Foreign
Authors and Investigators

COLLECTED AND ARRANGED

WITH CRITICAL EDITORIAL COMMENTS

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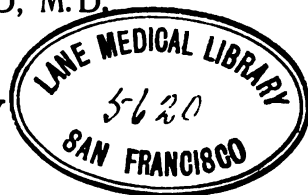
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UNDER THE GENERAL EDITORIAL CHARGE OF

GEORGE M. GOULD, M.D.

SURGERY



PHILADELPHIA AND LONDON

W. B. SAUNDERS & COMPANY

1901

Visual Aids

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PREFACE.

THE experiment made last year in issuing this work in two volumes has proved very acceptable to subscribers and is continued.

The increased popularity of the YEAR-BOOK is gratifying to the editorial department.

The single change in editorship is the association of the scholarly pathologist Dr. Aloysius O. J. Kelly with Dr. Riesman in the section on Pathology.

GEO. M. GOULD.

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GENERAL SURGERY.

By W. W. KEEN, M.D., AND J. CHALMERS DAcOSTA, M.D.,

OF PHILADELPHIA.

ASEPSIS AND ANTISEPSIS.

M. E. Janes¹ recommends the use of **sutures made from the tail of the rat**. He says that a rat's tail contains a number of thin strong tendons about 6 inches long. He isolates these tendons in the following manner: Make a circular cut through the skin at the root of the tail, and turn the skin inside out; detach a bundle of fine tendons near the last vertebra, and take them from the whole length of the tail. From each one of these bundles several strands may be obtained. If the threads are extracted with aseptic care, they may be used as obtained, and may be kept in the dry form or in alcohol until wanted. These sutures are especially useful in ophthalmic surgery. The threads are readily absorbed in the tissues.

Augé and Casteret² use **sodium bicarbonate for dressing suppurating wounds**, and insist that it allays pain and inflammation and arrests suppuration. They do not consider that this is due to a germicidal power, but arises from the fact that an alkaline solution strengthens tissue resistance. They use a solution of 2% to 4% in sterile water.

Tissot³ writes upon the properties of **hydroxyl as used in surgery**. He states that it is an efficient germicide and deodorizer. It has no poisonous properties and arrests capillary hemorrhage. In operations upon the nose this agent is of great service by quickly arresting hemorrhage. It is of more value in epistaxis than is cocaine or antipyrin. It has been used in operations for osteomyelitis and sarcoma of the breast. It is a valuable deodorizer in the treatment of putrid cavities and in lacerated wounds. In gunshot wounds which become septic or gangrenous it is of great service. Its application causes no pain, no local irritation, and is not followed by any poisonous effects.

M. L. Harris⁴ recommends the **closure of abdominal wounds** by what he calls the longitudinal silver wire suture. He believes that wire is one of the very best of suture materials. He calls his suture the longitudinal suture because it parallels the wound. The idea of a

¹ Lyon méd., Nov. 5, 1899.

² Gaz. des Hôp., Sept. 7, 1899.

³ Lyon méd., Nov. 19, 1900.

⁴ Jour. Am. Med. Assoc., Aug. 12, 1899.

longitudinal suture dates back to Chassaignac, who in 1852 employed a silk suture extending lengthwise and lying beneath the surface. The subcutaneous continuous catgut suture has long been used. The use of silver wire for the subcutaneous suture originated in the Johns Hopkins Hospital. Harris has extended the use of the longitudinal suture so as to include not only the skin edges, but the deep layers as well. Three layers of suturing are employed in closing a median celiotomy wound—peritoneal, fascial or sheath of the rectus, and subcuticular. For the peritoneal layer wire No. 24 to No. 22 is threaded upon a smooth, round,

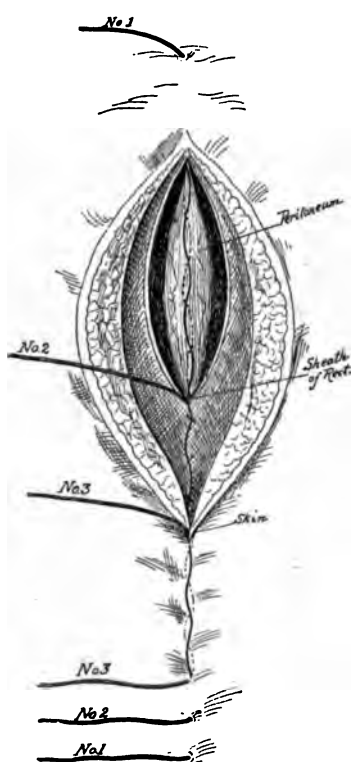


Fig. 1.—The longitudinal silver wire suture, showing the three layers of wire sutures in partly closed medial incision: Suture No. 1, peritoneal suture; No. 2, suture of fascia; No. 3, subcuticular suture (Harris, in Jour. Am. Med. Assoc., Aug. 12, 1899).

noncutting, curved needle; the needle enters the skin in the midline, from 1 cm. to 3 cm. from the angle of the incision, penetrates between the tissues obliquely to the peritoneum, and appears at the angle of the peritoneal incision; the peritoneum is taken up with the needle parallel with, and quite near to, its edge, first one side and then the other until the length of the incision has been traversed; the suture is brought obliquely to the surface about the same distance from the cutaneous angle as at the point of entrance. The second suture is of wire No. 22 to No. 30; enters into the midline, but a little nearer to the angle of incision, and penetrates to the sheath of the rectus, where the edges of this fascia are taken up longitudinally in exactly the same manner as has just been described in showing how to use it upon the peritoneum. No sutures are applied to the recti muscles. At no point in the middle line do the recti muscles lie in contact with each other; hence in closing the median incision it is useless to suture these muscles together with the hope of obtaining union between them. The dense, thick, conjoined fascia of the linea alba in the upper part of the abdomen and of the firm anterior layer

of the muscle sheath below Douglas' fold is the all-important layer to be sutured. The third suture is the usual subcutaneous or subcuticular stitch. The line of union is covered with silver-foil. On this a sterile gauze compress is laid; the ends of the wires are folded over this compress. Over this is placed another compress, followed by the usual dressing of plain sterile gauze. The wires are allowed to remain in place from 10 days to 2 weeks.

Sneguireff¹ makes a report upon the use of an **absorbable ligature material** made from the ligamentum nuchæ of the reindeer. The ligament is separated in the direction of its fibers. The material is prepared as follows: It is soaked in ether to remove the fat. It is kept in oil of juniper for 2 weeks. The oil is removed with ether and alcohol and the tendon is soaked for 2 days in corrosive sublimate solution containing $\frac{1}{2}$ of 1% of corrosive sublimate and 90% of alcohol. It is then retained for 2 days in normal salt solution and is placed in alcohol to be kept until needed.

Pagenstecher² strongly advocates the use of **celluloid yarn** as a material for sutures and ligatures. He states that linen yarn was recommended for surgical use by Linhart and Trendelenburg in Germany and by Lawson Tait in England. Linen thread is an extremely cheap material, but it has as disadvantages a rough surface, a high capacity for absorption which increases its bulk, and a strong disposition on the part of the threads to become tangled. The thread is readily sterilized. If this material is impregnated with a solution of celluloid, its disadvantages are obviated. Pagenstecher employs celluloid thread for ligatures and for sutures, and uses it to the exclusion of all other materials. The material is manufactured at present by Lutgenau & Co., of Krefeld. This yarn is very firm and resistant, the surface is smooth, and it has no tendency to absorb pus or other wound secretions. The thread, after having been used, can not unravel or expand. Knots once tied are entirely secure. The material is much stronger than silk; hence finer threads may be used. It is so rigid that it is an easy matter to thread a needle with it, and it can be sterilized with steam without sticking together and without becoming entangled. It does not irritate the wound. Knots need not be tied excessively tight, which must be done when using silk or catgut, and such tightening is harmful because it constricts or cuts the tissues. Pagenstecher says that since he has used this material the results of his operations have greatly improved. He uses it not only for sewing the skin, but also for internal sutures on the bowel or the bladder, for suturing the capsules of joints, and to sew up torn crucial ligaments. [Pagenstecher prepares celluloid thread in the following manner: He boils the linen thread for 30 minutes in a 1% solution of carbonate of sodium, washes it well with boiling water, dries it by placing it between sterile compresses, and soaks it for a time in celluloid solution. It is sterilized by steam under pressure, and it can be kept in the dry state until wanted or may be preserved in an alcoholic solution of corrosive sublimate. The process is fully described in *Deutsche medicin. Wochen.*, April 6, 1899.]

W. W. Keen and R. C. Rosenberger³ write on the **surgical use of celluloid thread**. Rosenberger carried out a series of experiments to determine the tensile strength and the capacity for fluid absorption, the infectivity of the raw gut, and the action of corrosive sublimate, heat, formalin, and various chemicals upon it. Keen and Rosenberger con-

¹ *Centralbl. f. Chir.*, June 17, 1899.

² *Phila. Med. Jour.*, Feb. 10, 1899.

³ *Phila. Med. Jour.*, Mar. 10, 1900.

clude that the tensile strength is great, even for small sizes ; that the thread is very flexible and does not easily become untied ; and that, even without sterilization, after it had been sent from Germany in an ordinary paste-board box, the thread was sterile. Methods of sterilization, particularly dry heat, increase its tensile strength, and there is no method of sterilization which is not applicable to it. Under sterilization it elongates slightly. It absorbs fluids to the extent of 41 %, and this seems to be its only disadvantage. It has been used with great satisfaction in the Jefferson College Hospital. It is undoubtedly a most satisfactory material for sutures and ligatures. It is much cheaper than catgut or silk and seems to be one of the very best materials.

Hamilton Fish¹ describes a **new sterilizer** for country and private practice. This is adjustable to the ordinary household tea-kettle. It is



Fig. 2.—Fish's sterilizer (Hamilton Fish, in Jour. Am. Med. Assoc., Nov. 18, 1899).

easily portable and is always ready for use wherever a tea-kettle and boiling water are obtainable. Dressings may be packed and sterilized in this instrument and kept ready for immediate use. The apparatus consists of a double copper cylinder and two frames of woven wire, which can be removed ; between these frames the material for sterilization is placed. A cone-shaped adjuster fits the cylinder so that it can be applied to the mouth of any sized tea-kettle, and when not in use it is reversed within the lower end of the cylinder and there are two tightly fitting covers. When it is to be used to sterilize dressings, the materials are placed within the cylinder and lie upon the lower wire frame. The upper frame is placed over them, the top cover is applied, and the adjuster is removed and applied to the lower end of the cylinder and to

¹ Jour. Am. Med. Assoc., Nov. 18, 1899.

the mouth of the tea-kettle. The kettle spout is plugged with a tightly fitting cork, and the steam under pressure passes through the dressings and congeals on the inner surface of the cover. After a sterilization of from one-half to one hour the dressings are found to be quite dry.

Leonard Freeman¹ makes a report on some experiments relating to the **sterilization of the hands**. His conclusions are as follows: "(1) None of the methods of sterilizing the hands can be absolutely depended upon. Many positive results are reached by means of faulty experimental technic; the culture-media becoming impregnated with antiseptics, the skin temporarily hardened by alcohol, formalin, etc., or the hands not subjected to sufficient maceration and friction in the culture-medium. (2) Under circumstances in which it seems desirable to do so, much may be accomplished by sweating the hands in a hot-air oven, by wearing rubber gloves for some time prior to an operation, or by immersing the gloved hands in hot water. Mere prolonged soaking in very hot water, although not so effective as dry, hot air, must have some favorable effect. It is difficult to understand, however, how the sweating method can dispose of all the micro-organisms beneath the nails. The procedure will hardly be extensively employed, owing to its inconvenience. (3) Excessive brushing beneath the nails, as much even as the sensitive tissues will tolerate, seems merely to stir up the bacteria when carried beyond a certain point. We can hope to accomplish little by this means. (4) So far, the only really reliable means of rendering the hands aseptic is to incase them in sterilized rubber gloves. But if the gloves become torn, as they often do, the danger of infection is considerable, owing to the bacteria which have accumulated beneath, from perspiration. Coating the hands with various substances has been tried and found ineffectual. Cotton gloves, although they soon become contaminated by exudations from the skin, probably do some good, especially if frequently changed, by filtering out the bacteria, and preventing their entrance into wounds."

[The three methods of sterilizing the hands which give the most satisfaction are Fürbringer's, Welch's, and the Weir-Stimson method. Abbott² thus describes the two first-mentioned plans:

"*Fürbringer's Method*.—(1) Remove all dirt under and around the nails; (2) brush nails and skin of hands thoroughly with soap and hot water; (3) immerse in alcohol, 95%, for not less than a minute, and before this evaporates (4) plunge the hands in 1:500 corrosive sublimate or 3% carbolic acid solution, and thoroughly wash them for at least a minute, after which the hands may be rinsed in warm water and dried.

"*Welch's Method*.—(1) The hands and nails are to be thoroughly cleansed with hot water and soap. The water is to be as hot as can be borne, and the brush used is to have been sterilized with steam. This preliminary brushing to occupy from 3 to 5 minutes. (2) The hands are then rinsed in clear warm water. (3) They are then immersed for

¹ Ann. of Surg., Oct., 1899.

² Hygiene of Transmissible Diseases.

1 or 2 minutes in a warm saturated solution of permanganate of potash. While in this solution they are rubbed thoroughly with a sterilized swab of absorbent cotton. (4) They are then placed in a warm saturated solution of oxalic acid and kept there until completely decolorized. (5) They are then thoroughly washed in clean sterilized water or salt solution. (6) Finally, they are immersed for 2 minutes in 1 : 500 corrosive sublimate solution, rinsed in water, and dried."

The method of Weir and Stimson is as follows : Scrub the hands with green soap in running water. Clean under the nails with a bit of orange wood. Put a tablespoonful of chlorinated lime into the palm of the hand and add an equal amount of carbonate of sodium ; add enough water to make a creamy mixture and rub until granules disappear. Rub the cream into the skin of the hands and forearms, and put it around and under the nails by means of the stick. Nascent chlorin is liberated and disinfects. Wash off the paste with warm sterile water. We have used both the foregoing plans, and prefer the last, considering it the most effective. It is impossible to clean the hands perfectly, although, as Mikulicz and Flügge point out, most of the epiphytes remaining after attempted disinfection are harmless, although *staphylococcus albus* is sometimes found. The only certain means of rendering the hands aseptic, as Leonard Freeman says, is to incase them in rubber gloves. Sännger maintains that in 78 % of cases absolute sterility of the hands can be obtained by the following method : Use a warm solution of HCl (2-5 %) for 2 minutes and a solution of permanganate of potash ($\frac{1}{2}$ -2 %) for two minutes. Free chlorin is developed, also oxygen and sulphuric acid. The brown stain can be removed by applying a solution of sulphurous acid.]

Döderlein¹ makes a study of the **bacteria found in wounds**, which wounds were **made with aseptic care**. He considers the usual statistics regarding the aseptic state of wounds which healed by first intention as entirely useless, and he has found, in taking cultures from time to time during an operation, that the number of colonies of bacteria which will develop on a Petri plate are in direct proportion to the time of the operation and the amount of manipulation of the parts. Bacteria were invariably found, and yet the cases ran a successful course. The operator himself furnishes most of these organisms. It is impossible to render the hands absolutely sterile. Even when the surface of the body is made sterile temporarily, epithelium is cast off during the operation and exposes organisms which will enter the deep layers. It is a fortunate circumstance that the inevitable contamination of wounds with nonpathogenic organisms does not matter ; and the surgeon need wear gloves only when his hands have recently been in contact with septic matter or with virulent pathogenic organisms.

Christian Fenger² sets forth the method of **preparation and disinfection of the patient** before a surgical operation. Whenever possible, the patient should be in the hospital for from 24 to 48 hours previous to the operation. He thus becomes somewhat accustomed to life in the hos-

¹ Münch. med. Woch., June 27, 1899.

² Chicago Med. Recorder, Feb., 1900.

pital and to nurses and physicians, and overcomes some nervousness and apprehension. During this period his life should be made as pleasant as possible. He should be allowed to rest in bed or to lounge about his room, as inclination or circumstances dictate, and few or no visitors should be admitted. During this time the surgeon may come to recognize some peculiarity that may be of aid in the after-treatment. Physical improvement is brought about by rest, diet, hygiene, and possibly by medicines. Good, nutritious food should be given in such quantity and at such intervals as the necessities of the case dictate. An attempt should be made to correct any abnormality or irregularity of the gastrointestinal tract. Constipation is corrected by a gentle laxative and rectal enemas. Even if constipation does not exist the lower bowel should be emptied and washed out, because, in spite of regular action of the bowels, quantities of fecal matter are retained in the sigmoid and colon which it is difficult to remove after operation, and which, if allowed to remain, may cause septic infection or auto-intoxication. The lungs, the heart, and the urinary organs should receive careful attention. The most important point in the antiseptic preparation is mechanical cleansing. The chief principle in preparing the skin is the mechanical removal of the offending matter, which consists mostly of masses of loose epidermis with bacteria. This is accomplished by soap and water and frictions with a stiff brush. Shaving, washing, and scrubbing not only remove the greater part of the infective material, but place the skin in a favorable condition for the action of a chemical germicide. Too much confidence is usually placed in chemical germicides. They are all more or less poisonous, and if used in sufficient strength to kill germs, they are certain to damage the tissues; and if used so weak as not to damage the tissues, they are not strong enough to kill germs. The first step in the antiseptic treatment consists of a general bath, and it may be necessary to repeat this bath once or twice. After the general bath the region to be operated upon must receive attention. If the skin is hairy, it must be shaved. Shaving is followed by thorough scrubbing with hot water and potash soap, using a brush with stiff bristles or wood fiber. The soap is removed with pure water, alcohol or ether is applied, and then the entire field is washed with mercuric chlorid 1:1000. The mercurial solution is poured upon the skin for some time, and is rubbed in with sterile sponges. The region thus prepared extends for a considerable distance beyond the line of the proposed incisions. A dry sterile dressing is now applied, covering the entire field, and remains in place until the time of operation. If necessary, just before the operation a similar procedure may be gone through with. In females the vagina should be washed out with a mercuric chlorid douche. In all patients the rectum should receive attention as previously directed. At the time set for operation the patient is taken to the anesthetizing room, where an anesthetic is administered, and then into the operating room. The patient's clothing is removed and taken from the room. The patient is placed upon the operating table upon a rubber bed containing warm water, and is covered with sterile sheets and with blankets in such a way as to

expose the field of operation. The dressing is removed with scissors; the field of operation and the adjacent surface is again scrubbed with a brush quite energetically, but not enough to injure the epidermis. It is important not to damage the intact epidermis, as it is an efficient barrier and protection against bacterial invasion, and its removal serves as an additional infection atrium. The scrubbing is continued until a vivid red hue appears. Natural creases, artificial creases, and the umbilicus demand special attention. The soap is first removed with sterile water and then with alcohol or ether. Mercuric chlorid is now applied liberally and rubbed into the skin with sponges. A sterile towel wrung out of chlorid solution is laid upon the skin surface, and the laparotomy sheet is placed in position. It is made with closed sleeves, in which are placed the arms and hands of the patient, which may be crossed over the chest and pinned in place, or may be fixed at the patient's side. Over this sheet and around the opening in it are placed sterile towels. If soiled, these may be removed and replaced by clean ones. The towel over the cleansed area is now removed and the patient is ready for the incision.

Carl Beck¹ writes on some important points regarding perfection of **asepsis**. His conclusions are as follows: It is important to sterilize carefully the skin of the patient and the hands of the surgeon. The atmosphere is innocuous. Inorganic material is rendered aseptic by boiling; the skin surface is asepticized and only the skin-glands contain bacteria; infection will be produced only if they are roughly manipulated. While making the skin incision the surgeon should wear aseptic gloves, and the assistant who hands the instruments and the assistant who aids in the operation should wear gloves during the entire procedure. After making the incision the edges of the skin should be covered with sterile towels, which are fastened to the wound surface underneath the skin edges with small forceps. This keeps the skin edges from being touched during future manipulations. The knife used for the skin incision is not used for subsequent incisions. The skin is closed by a subcutaneous method. Forceful manipulation, especially tearing with a blunt instrument, is injurious. The surgeon and his assistants wear sterilized gowns, and their heads are covered with sterilized caps; a surgeon should not have a long beard. If the surgeon suffers from rhinitis or tonsillitis, he should use the greatest precautions, or, better, should not operate until recovered. It is a crime for a surgeon who has a suppurating process on his hand to operate.

AMPUTATIONS.

Bloodgood² discusses the question of **when to amputate in the recently injured**. His views are as follows: "Recently injured limbs demanding amputation can be divided into two groups: Those patients whose general condition is good, the symptoms of shock slight,

¹ Med. Rec., Oct. 7, 1899.

² Progressive Medicine, Dec., 1899.

and in whom the loss of blood has been but very little. In such cases an amputation may be done at once. Nevertheless, there is no great hurry, and it is always better to give the patient the benefit of the doubt. The patient should be placed in bed and external heat applied; salt solution by the rectum and under the skin, although not positively indicated, will be a safeguard. A hypodermic of morphin (gr. $\frac{1}{10}$ to $\frac{1}{8}$) will do good by its relief of pain and restlessness. The injured part can be prepared carefully for operation. This delay of from 1 to 2 or 3 hours decreases rather than increases the possibilities of death. The operation can be performed carefully and completely, and unless the surgeon misjudges the condition of the patient, the mortality should be practically *nil*. All other cases belong to the second group. In these one observes all degrees of shock from varying amount of loss of blood, and shock due directly to the extent and nature of the injury. In such cases one should check the slightest loss of blood, and at once treat the patient most energetically for shock and loss of blood, if any has occurred. Quiet in a bed elevated at the foot, external heat, repeated and *slow* infusion of salt solution beneath the breasts, and, if retained, salt per rectum, hypodermic injection of small doses of morphin (gr. $\frac{1}{20}$ to $\frac{1}{10}$), unquestionably do good. The advantages of hypodermic injection of strychnin and atropin are difficult to estimate. Hare is very positive that atropin is indicated, because of its action on the vasomotor apparatus. It seems settled, from a pathologic standpoint, that it is not the heart but the vasomotor system that is collapsed in shock. The heart needs more fluid, which can be supplied by salt infusion, but the vasomotor construction needs assistance; its weakness with dilatation of the vessels means death; theoretically, and apparently practically, atropin is the drug. External heat, with elevation of the foot of the bed, and salt solution are the chief remedies. The amputation must not be delayed too long; after perhaps 6 hours, each hour increases the danger of infection; but just how long the surgeon should delay is a difficult and, I believe, not yet settled question. In the majority of cases, if the patient is to recover at all from the shock, some signs of improvement should be seen in 4 to 6 hours. In these cases the operation should be rapid and the anesthetic time very short. The operation should consist of a simple amputation of the crushed member." [We agree with Bloodgood that it is only when shock is slight that it is justifiable to amputate at once. In most cases it is proper to bring about reaction before operating. If the attempt to bring about reaction is futile, the operation will prove fatal.]

Charles A. Powers¹ discusses the question of the origin of a **conical stump** after amputation in childhood. He states that after amputation of the upper part of the arm or the upper part of the leg in childhood, the gradual development of a conical stump is physiologic, and may be expected. "This is quite independent of the nature of the stump after the original amputation. It is because the humerus and the leg bones are developed in large part from their upper epiphyses. The

¹ Ann. of Surg., April, 1900.

growth takes place at these epiphyses and simply pushes the bone down through the soft parts. Some years ago I presented ¹ a number of these cases before the New York Academy of Medicine. Unless the child's parents are warned by the surgeon at the time of the first amputation of what is likely to occur, they may blame him when the conical condition appears. The principle is a fixed one ; it should find a place in our text-books and it should be taught to students."

Ssalistschew ² reports a case of successful removal of the lower extremity and innominate bone. He designates the operation **exarticulatio interilio-abdominalis**. There are two methods of performing the operation : (1) The method of Jaboulay. In this operation the iliac vessels are tied, the symphysis pubis is divided, and the sacro-iliac articulation is divided. Jaboulay's operation has been performed 4 times before Ssalistschew did it, and death followed in each case. (2) The method of Girard and Bardenheuer. In this operation the iliac vessels are tied and the bone internal to the thyroid foramen is not removed. In the case herein reported, Jaboulay's operation was performed. The patient suffered from a periosteal sarcoma, which arose from the innominate bone, passed through the thyroid foramen, and involved the femur. An incision was made from the anterior extremity of the last rib to the anterior superior iliac spine, and this incision was carried along Poupart's ligament to the pubic spine. The common iliac arteries were exposed and ligated. A posterior oval flap was then formed. In order to form this, an incision was carried from the pubic spine, along the cruro-perineal fold to the ischial tuberosity and then carried back of the great trochanter to the middle of the iliac crest. From this latter point it was carried forward to the anterior superior spine, where it joined the first incision. The soft parts were incised ; the symphysis pubis divided and separated ; the psoas muscle, the anterior crural nerve, the obturator vessels and nerve, and the sacral plexus were cut ; the sacro-iliac ligaments were cut and the extremity was removed. The bleeding was not profuse. The wound was sutured and the patient recovered. For a short time there was paralysis of the bladder.

Mr. T. J. Verrall ³ reports a case of **interscapulothoracic amputation**. The chief dangers are hemorrhage and shock. Hemorrhage is largely controlled by preliminary ligation of the subclavian vessels, but this does not prevent bleeding from the suprascapular and posterior scapular vessels. Of 43 cases in which this operation was performed for malignant disease, 34 recovered from the operation ; in 10 of these, the ultimate result was not certain ; in 14 of the balance, recurrence took place, and in 11 of the 14, recurrence took place within 1 year of the operation. The patient was a woman of 39 who was suffering from sarcoma of the upper part of the humerus involving the shoulder-joint. "Previously to commencing the real operation an incision was made into the tumor. This, which showed an extensive malignant growth, was unnecessary for diagnosis, but the patient had been promised that

¹ N. Y. Med. Rec., June 7, 1890, and April 7, 1894.

² Centralbl. f. Chir., Sept. 2, 1900.

³ Lancet, Feb. 10, 1900.

the arm should not be sacrificed till the examination of the tumor had been made. As much blood was lost from this incision as from the rest of the operation. It was also to be deprecated on account of the risk of infecting sound parts. After removing the middle third of the clavicle and cutting through the subclavius no difficulty was found in securing first the subclavian artery and then the vein, each between two ligatures. Skin flaps, pectoro-axillary and cervicoscapular, were made, the arteries were caught as they were divided, and there was no bleeding of consequence till the division of muscles attached to the posterior border of the scapula. The wound was drained with one tube. The operation was very well borne. The long wound healed by primary union, with the exception of $1\frac{1}{2}$ inches at the center, where there was a superficial slough of the flap edge. This part was not quite healed when the patient left the hospital on the seventeenth day." This operation was performed 22 months before the report was made, and the tumor had not recurred up to the time of the report. Verrall calls attention to Russell Fowler's view that this operation should be performed in every case of malignant disease of the humerus, whether in the shaft, the upper extremity, or the lower extremity of the bone.

Robert G. Le Conte¹ reports a case of **interscapulothoracic amputation** performed for recurrent sarcoma of the shoulder in a man of 49. As a preliminary step he disarticulated the sternal end of the clavicle and ligated the subclavian vessels. The incision was begun over the sternal end of the clavicle, was carried along the bone to its middle, and was then carried downward to the anterior fold of the axilla. The skin and superficial fascia were dissected up, the inner two-thirds of the clavicle was exposed, the clavicle was divided from the sternum and first rib, and its inner end was pulled forward and outward, and the subclavius muscle was separated from the bone. The pectoralis minor was divided. The sheath of the vessels was exposed and opened. The subclavian artery was tied. A ligature was passed around the vein, the arm was raised for a time to empty it of blood, and the vein ligature was tied. The ensuing operative steps were almost bloodless. Le Conte claims that this method so freely exposes the vessels that ligation is safe and easily performed; that it is a quicker and easier method than that of resecting the middle third of the clavicle; if the clavicle is involved in a malignant growth, the complete removal of the bone is desirable. Over half a century ago Mussey performed a similar operation, but the patient died from entrance of air into the vein.

A. W. Mayo Robson² writes regarding the **interscapulothoracic amputation**. He has performed it twice. Each patient promptly recovered from the operation, and in both cases primary union was obtained. Text-book directions are of little use, because "the coat has to be cut according to the cloth." The flaps must be obtained from healthy skin, and in the first case these were secured from the posterior, and in the second case from the anterior, surface of the upper arm. "For preventing loss of blood the limb to be removed was Esmarched and a tourniquet

¹ Ann. of Surg., Sept., 1899.

² Lancet, July 29, 1899.

was applied at the middle of the arm so as to utilize all the blood in the arm to be removed, this being supplemented in the first case by exposure of the subclavian artery and vein and clamping them with large pressure forceps, and in the second case by pressure on these vessels above the clavicle by means of a well-padded forceps handle. During the course of the operation the vessels were caught in pressure forceps immediately on division, and subsequently ligated, the loss of blood in each case being trifling. As a pocket is necessarily left when the wound is closed, I found an advantage in draining it by means of a stab wound at the most dependent part, the tube being removed in 36 hours. The subsequent deformity is so great that,

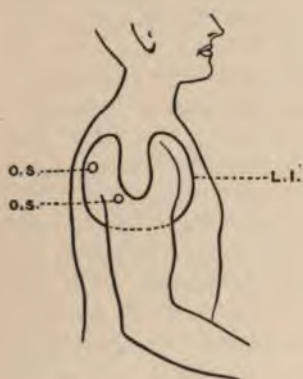


Fig. 3.—O.S. and O.S. indicate old sinuses; L.I. marks the line of incision, dotted to show its course beneath the arm (Robson, in *Lancet*, July 29, 1899).

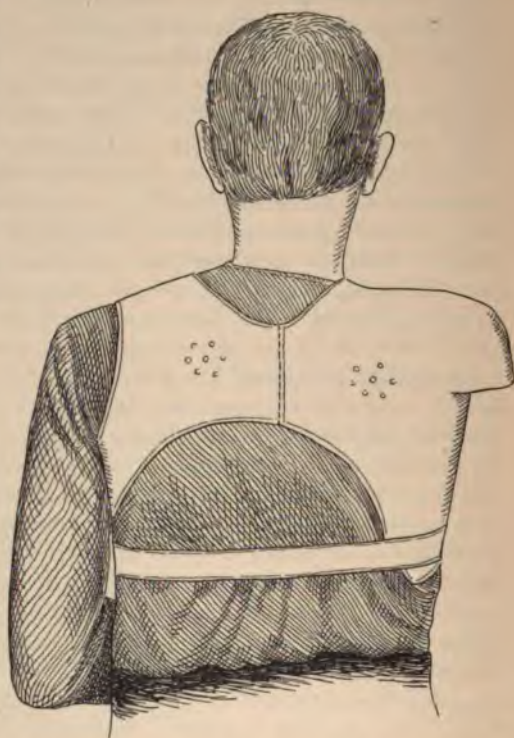


Fig. 4.—Showing apparatus for concealing deformity produced by operation (Robson, in *Lancet*, July 29, 1899).

apart from any risk in the operation itself, it can be justifiable only when all other means of relief have been exhausted." In one case Robson removed the outer half of the clavicle. In another case the incision shown in figure 3 was made. In this case the clavicle was also divided. Figure 4 shows an apparatus for concealing the deformity.

J. William White¹ reports two cases of **interscapulothoracic amputation**. The essential points of the operation are the preliminary ligation of the subclavian artery, making the limb bloodless by

¹ Univ. Med. Mag., May, 1900.

elevation, and ligation of the subclavian vein. In many cases these ligations can be made above the clavicle, but as that bone is to be removed at any rate, as the soft parts are often involved, the relations altered, and the depth of the subclavian triangle increased, the resection of the middle third of the clavicle should precede the ligations. If the outer end of the clavicle is diseased, disarticulation at the sternal articulation and removal of the entire bone should precede ligation. Most of the trouble encountered in the operation is due to bleeding from large veins and possibly from the subscapular or other arteries. After the artery and vein have been tied, the hemorrhage is very slight until the surgeon separates the scapula, "when a large number of vessels will have to be clamped and tied, many of them abnormally enlarged and unnamed descending from the neck; the suprascapular and posteroscapular and their branches will also be divided. If the usual precautions against shock are taken, the operation may be, and should be, proceeded with most deliberately. One torn vein beneath the clavicle will affect more seriously the operative prognosis than a half-hour spent in carefully finding and ligating it. It must be remembered that of the 8 fatal cases in Fowler's table, 6 died of hemorrhage or shock. Berger's method has so simplified the control of bleeding that henceforth few deaths should result from these causes. The ultimate results are more important than the immediate, and an analysis of the existing evidence shows that they are very unsatisfactory. If 1 year of freedom from recurrence is accepted as evidence of 'cure,' and if the operative deaths, and the cases insufficiently reported, and the cases reported too soon be eliminated from Fowler's tables, we have remaining 30 cases, 16 of which died of recurrence and 14 were alive and well 1 year or more after operation. That would place the percentage of ultimate recoveries at 46 $\frac{2}{3}$. But if we want to know about the chances of a given patient to recover from the operation and be alive and well at the end of 3 years,—a period none too long to determine cure in cases of malignancy,—we find that we have before us the evidence of only 6 of the 72 patients having done so. Perhaps others from among the imperfectly reported cases, or from among those reported too soon, did recover, but we have no testimony to that effect. In the same way, and without manipulating figures (not that such manipulation is improper if the reasons and methods are frankly stated), we find that of Berger's 44 cases, 3 were alive and well after 3 years. Of Butlin's 20 cases of central sarcoma of the humerus (not all operated on by the intrascapulothoracic method), 4 died, 6 were lost sight of, and only 2 were alive and well at the end of 3 years. The same writer says that, taking the cases of subperiosteal sarcoma since 1887, there are 18 cases that recovered, of whom something is known; of these, 2 were alive and well after 3 years had elapsed. In one of these no microscopic examination of the tumor was made. It was at the lower end of the humerus. The other was in the middle of the shaft and did not involve the soft parts. Butlin's figures are given as evidence that the general results from various operations have not yet differed very greatly."

White reports two successful operations—one for sarcoma and one for caries. White's conclusions are as follows: "(1) The indications are, as a rule, the existence of malignant disease in the humerus, or in or about the shoulder-joint, the usual form being sarcoma. (2) The justifiable tendency of surgeons at the present day is to adopt this operation in all cases of sarcoma of the humerus. (3) If any exceptions to this rule are to be made, they will include only central sarcoma. Tumors of this type of small size, and within the lower epiphysis, may perhaps be treated successfully by amputation at the upper third, while central sarcomata involving the lower third of the diaphysis may perhaps be properly treated by shoulder-joint amputation. More positive assertion does not now seem warranted. (4) In cases of doubt, the evidence at present available justifies the advice that surgeons should incline toward the interscapulothoracic method. (5) The mortality from the operation itself should not be more than 10% and is probably somewhere about 6%. (6) The prognosis as to recurrence is not very favorable, although a large percentage (46 $\frac{2}{3}$) is reported, fixing arbitrarily the period after operation at 1 year. The time is too short to make such figures of much value. Taking 3 years as the test period, we find that a percentage of 8 $\frac{1}{3}$ is more nearly accurate; or at the very best, if we eliminate the cases that died, the cases that lack data, and the cases that were reported very early and not followed up, as well as the similar cases, we would still find a percentage of cure of only 20, which, in my opinion, is by far the most favorable view of the operation, that can with any fairness be taken. (7) There seems to be no doubt that the mortality and the ultimate result are both unfavorably influenced, if the operation is what is known as 'consecutive': *i. e.*, one in which a previous disarticulation at the shoulder-joint has taken place."

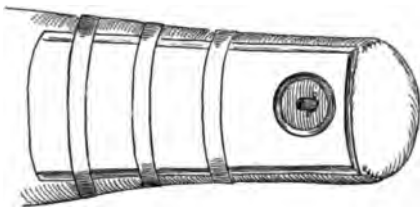


Fig. 5.—Posterior surface of a thigh stump with splint applied (Shield, in *Med. Jour.*, Feb. 3, 1900).

Russell Fowler¹ in a valuable article has fully collated the literature upon interscapulothoracic amputation.

A. Marmaduke Shield² has devised a **splint for use after amputation**. "After amputations, especially of the thigh, it is customary to support and bandage the stump upon a suitable splint. This is removed at each dressing, and the shifting and readjustment sometimes cause pain and annoyance to the patient. The painful quivering so often seen when the support is suddenly withdrawn is familiar to most of us. To meet this inconvenience I have devised a simple plan, which has seemed to me of great utility. The opening for the tube is made through the posterior flap, or, in the case of lateral flaps, the tube is brought out pos-

¹ *Ann. of Surg.*, Jan. and Feb., 1900.

² *Brit. Med. Jour.*, Feb. 3, 1900.

teriorly. In the end of the splint a large circular hole is cut, and the anterior end of the splint around this aperture is thickly padded with soft iodoform gauze. When the flaps have been accurately sutured, the splint is applied next to the limb, and secured with adhesive strapping and gauze bandages. The tube appears through the center of the large circular opening in the splint. Nothing now remains but to apply the usual dressings. The opening in the splint is padded with strips of iodoform gauze and a thick layer of salicylate wool. At the early dressings this can be constantly renewed. Here alone oozing will take place. The tube can be flushed and slowly withdrawn in the usual manner, without the least disturbance of the splint. In almost all the cases I have left the splint in through the whole healing process. If there is any soiling, it can easily be changed, but this has to be done only once. Should the stump suppurate, of course this method is not so applicable."

ANTHRAX, ERYSIPELAS, AND TETANUS.

The Lancet¹ reports 10 cases of **malignant pustule** under the care of Mr. Puzey, Mr. Harrison, and Mr. Murray. The treatment consisted of excision, cauterizing with pure carbolic acid, dusting with powdered ipecacuanha and the administration of ipecacuanha internally (5 grains every hour). Nine of the cases recovered. The microscopic examination of the fluid in the vesicles confirms or destroys the diagnosis of anthrax. The blood should always be examined for bacilli. If bacilli exist in the blood, excision offers much less prospect of benefit than when the blood is free from bacilli, although cases have recovered even when the blood contained bacilli.

A case of **traumatic tetanus cured by injection of brain emulsion** is reported by Krokiewicz, of Cracow,² who has previously had 2 successful cases under the same treatment. The present case followed a leech-bite, the symptoms having fully developed on the tenth day. Administration of narcotics failing, an emulsion of an entire rabbit's brain was injected, with great relief from the spastic convulsions. Three injections were given and patient was cured in 3 weeks. No abscesses followed. In the first of the author's cases³ an emulsion of a calf's brain was used with physiologic salt solution. In 3 injections 233 grains were used, with good results except for abscess formations at the point of injection. The next case reported was by Schramm,⁴ who used 240 grains of emulsion of rabbit's brain, filtered through thick sterile gauze, with freedom from abscess formation. In Krokiewicz's second case⁵ 600 grains were injected under Schramm's precautions, with successful results.

¹ Jan. 20, 1900.

² Wien. klin. Woch., No. 34, 1898.

³ Wien. klin. Woch., No. 28, 1899.

⁴ Przegląd lekarski, No. 3, 1899.

⁵ Wien. klin. Woch., July 13, 1899.

The following prescription is recommended ¹ for **facial erysipelas**:

R.	Pure carbolic acid	15-	75 gr.	
	Tinct. iodin	15-	45 "	
	Alcohol	75-	150 "	
	Oil of turpentine	225-	300 "	
	Glycerin	1200	"	M.

Paint the surface affected every 2 or 3 hours, and cover with antiseptic gauze.

The use of **mercurial ointment in the treatment of erysipelas** is recommended by Dematteis,² who reports successful results in 8 cases. The ointment is used pure or diluted with vaselin, and is effectual not only in the stationary but in the spreading cases. The extension of gangrenous erysipelas is prevented by its use.

Laplace³ reports a case of **tetanus treated by subdural injections of antitoxin and hypodermic injections of carbolic acid**. In Laplace's case the symptoms developed 10 days after the injury, and 5 days later the patient was trephined and 20 cc. of antitetanic serum were injected subdurally. Two days later 40 cc. of serum were injected, followed 2 hours later by a rise of temperature from 98° F. to 101° F. A numbness of the opposite side developed which lasted for 2 days. Twenty-four hours after the second injection attacks of opisthotonos lasting from 5 to 15 minutes set in. Two days later the spasms became milder, and hypodermic injections of pure carbolic acid in water were given every 3 hours, and were continued for 6 days, making $\frac{1}{2}$ of an ounce of acid given in this way. The original wound area was excised on the sixth day of the disease. On the twenty-fifth day of the disease the patient was convalescent. The author thinks the subdural method superior to the subcutaneous for the reason that the antitoxin is to a certain extent oxygenized when passing through the lungs, while by the direct method the effect is more powerful and chemically different. The antitetanic serum used was prepared in the Pasteur Laboratory in Paris.

The results of **intracerebral injections of antitetanic serum** in 5 cases of tetanus are reported by M. Quénu, of Paris.⁴ In the first case 40 cc. of serum were injected through a lumbar puncture, and as no benefit was derived, 8 cc. were injected intracerebrally. Some improvement was noticed, but the patient died on the second day following. In each of the other cases death followed in 1 or 2 days after the injection of from 2 to 4 cc. of serum bilaterally. There were no symptoms of disturbance of the cerebral functions in any of the cases.

Thomas D. Gimlette⁵ reports a case of **tetanus successfully treated by intracerebral injections of antitetanic serum**. The case was a severe one, the symptoms developing 7 days after a slight injury. The injections were given after the manner of Roux and Borrel, of Paris, and the bacillus of tetanus was isolated from the wound.

¹ Riforma med., Nov. 28, 1899.

² Gaz. degli Osped. et delle Clin., Oct. 1, 1899.

³ Phila. Med. Jour., Mar. 17, 1900.

⁴ Bull. et Mém. de la Soc. de Chir., 1899, t. xxv, p. 254.

⁵ Lancet, July 8, 1899.

Dr. Wm. F. Gibb¹ reports a case of acute tetanus treated by intracerebral injections of antitoxin, with recovery, but followed later by death from brain abscess. In this case the symptoms of tetanus appeared 17 days after a crush of the hand which occurred on February 2d; 71 cc. of serum were injected into the brain, and 104 cc. hypodermically. Nine days elapsed before signs of improvement were manifest, but, with the exception of a scarlatiniform rash, there were no bad symptoms from the injections. On April 28th headache and vomiting occurred, followed by death on May 5th. Post-mortem examination showed abscess cavities in each frontal lobe.

In a case of acute tetanus developing 8 days after an injury, intracerebral and intravenous injections of antitetanic serum were given by Alexander B. Johnson,² with recovery. Four hundred and ninety cubic centimeters of serum were given, of which 5 cc. were injected into each cerebral hemisphere. The author thinks that if no improvement is manifest after 24 or 36 hours, we should inject the serum into the spinal canal by lumbar puncture.

In making an analysis of the results of intracerebral and subcutaneous injections of tetanic antitoxin in nine cases of traumatic tetanus, Dr. Robert Abbe³ states that the laboratory experiments of Roux and Borrel held out so much promise that he was prompted to follow their method in the human being. In the *Annals of the Pasteur Institute*, of April, 1898, the intracerebral method is shown to be greatly superior to the subcutaneous method, as Roux saved 35 guinea-pigs out of 45 tetanized, while only 2 out of 17 were saved by the subcutaneous method. The theory being that in a case of traumatic tetanus the toxin has entered the nerve-cells, and the hypodermic injection of the antitoxin destroys merely the poison remaining in the circulation, while the intracerebral injection brings about an alterative action on the cells themselves, by infiltration of cerebral tissue. In giving the injections into the brain-substance Roux's point is selected, which is half-way between the outer angle of the orbit and a point on the vertex, at the junction of the line crossing over between the two auditory canals. The needle is carried 2 inches deep into the brain-substance, and 3 cc. are injected into each frontal lobe, about 10 minutes being taken for the injection. Abbe reports in detail 9 cases, and concludes that a long period of incubation is not an "absolute criterion of the probable severity." Of the 5 cases trephined, 3 recovered and 2 died, but these were all grave cases. Noticeable action of the serum could be seen in 5 of the 9 cases treated. The serum used was from the laboratories of the New York Board of Health and from Parke, Davis & Co., the latter being noticeably more efficient. From his experience the writer considers the cerebral method superior to the subcutaneous, and worthy of further trial and study. In the discussion of Dr. Abbe's paper before the New York Surgical Society⁴ John Rogers, Jr., reported 3 cases, in one of which intracerebral injection failed, while failure followed the subcuta-

¹ Brit. Med. Jour., April, and July 1, 1899.

² Ann. of Surg., Mar., 1900.

³ Ann. of Surg., Mar., 1900.

⁴ Ann. of Surg., Mar., 1900.

neous use of New York Health Board serum in the other two cases. The speaker agreed with Abbe that the "severity of the infection can best be judged by the rapidity with which the symptoms progress after their development." G. R. Fowler reported a fatal result following an intracerebral injection. Willy Meyer stated that a very severe case had recovered from the subcutaneous use of Roux's serum, 100-120 cc. being given daily for 10 days. In some of his cases Meyer had used subcutaneously 3% carbolic acid solutions according to Borrell's advice. Arthur L. Fisk said that he watched the cases which Abbe reported, and his opinion was that the mortality would have been much higher if the serum had not been pushed as it was. The results showed a marked contrast with the old methods. W. G. Le Boutillier reported a case in which cerebrospinal meningitis had been mistaken for tetanus, and stated that of the 16 cases of tetanus he had seen, none had recovered. In concluding the discussion, Abbe said he thought the use of serum subcutaneously should be continued until the case became serious, and then intracerebrally, continuing the hypodermic injections, and giving bromids and chloral, with an ice-bag to the neck. The calomel purge as an eliminant, with free stimulation and nutritive enemata, he thought were important. In regard to lumbar puncture he considered the cerebral and subcutaneous methods wiser.

CYSTS AND TUMORS.

A. Trayer¹ reports a case of **carcinoma of the kidney** in which there was multiple involvement of the lymphatic glands. The patient was only 20 years of age, and for a considerable time had had a tumor in the left hypochondriac region and enlargement of the lymphatic glands. It was thought that the hypochondriac mass was an enlarged spleen. The surface of the mass in the hypochondriac region was nodular. The first lymph-glands to enlarge were in the left axilla and the groins. A diagnosis of pseudoleukemia was made. The patient died, and the necropsy showed the true condition. There were great masses of glands in the subclavian region of the right side, back of the sternum and between the aorta and the windpipe, and back of the peritoneum, but the mesenteric glands were free from involvement.

Delore² reports a case of that extremely unusual condition in man known as **botryomycosis**. The woman was 54 years of age and had a tumor attached by a pedicle to the ulnar margin of the hand close to the little finger. It looked something like a strawberry, and was not covered by epidermis. Six months previously it had begun as a wart, which bled at frequent intervals and grew progressively. Careful investigation showed the presence of botryomyces. It seems probable that in such a case as this the parasites enter into a pseudoriparous gland, causing proliferation of gland tissue beneath the epidermis. In these tumors great numbers of vessels develop.

¹ Cor.-Bl. f. Schweiz. Aerzte, Oct. 15, 1899.

² Brit. Med. Jour., Dec. 23, 1899.

Coley¹ discussed recently the **treatment of inoperable malignant tumors**. He said that three-fourths of malignant tumors become at some time beyond treatment by means of the knife. He referred to Manders' treatment by the employment of ferments. Manders lessens the amount of animal food which is given, allows no butcher's meat at all, and injects pure ferments. The real value of the method has not as yet been ascertained. There is no doubt that the treatment by injecting thyroid extract and removing the ovaries has a logical basis of fact. By the use of mixed toxins of erysipelas and bacillus prodigiosus spindle-celled sarcoma are most likely to be benefited. Coley's reported cases now reach the number of 159. Of 87 cases of round-cell sarcoma, 39 were improved and 1 case remained well at the end of 5 years; of 22 cases of spindle-celled, 8 remained well at the end of from 3 to 7 years, and 11 remained well at the end of from 1 year to 3 years. These materials are extremely powerful, and must be used with caution in order to avoid danger. They exert a distinct inhibitory action upon malignant growths; far less upon carcinoma, however, than upon sarcoma. In a majority of the cases of inoperable sarcoma treated by this method the patients live for more than 3 years after the treatment. The action of the material does not resemble in any particular that of a local cauterant.

Berger² reports a case of **endothelioma of the humerus**, and discusses the general subject of endothelioma of bone. He states that at present not enough is known to make a clear, distinct, and recognizable group of tumors of the bone-endotheliomata, a group distinctly separated from other forms of osteosarcoma. These growths are often pulsatile and are confused with angiosarcomata and plexiform sarcomata. In endothelioma of bone, if it is pulsatile, expansion resembles that of an aneurysm and is accompanied by a murmur; and it is a strange fact that not only primary growths, but secondary growths, possess the same character, giving both pulsation and murmur. In these cases the bone is destroyed and fracture not unusually occurs. This form of tumor is a most malignant one. It grows rapidly, and even if amputation of a limb is performed, there is usually recurrence of the growth. An interesting point is that when we recognize an isolated primary growth there may at the same time be latent, in various parts of the skeleton, other endotheliomatous masses, and these cases may really be what has been previously called general osseous sarcomatosis. Whenever a surgeon is brought in contact with a pulsatile tumor of the bone, he should carefully examine all the other bones for other pulsatile tumors before he decides on amputation.

J. Dutton Steele³ writes on the subject of **retroperitoneal sarcoma**. Males are more likely to suffer from the disease than are females, and it is most common in the first, fourth, fifth, and sixth decads of life. Traumatism has but little causative influence. These tumors grow with great rapidity; they usually begin in the lumbar region or in the abdomi-

¹ Boston M. and S. Jour., Jan., 1900.

² Rev. de chir., No. 1, 1900.

³ Am. Jour. Med. Sci., Mar., 1900.

nal wall near the mesenteric attachment. Only about 2% have a pelvic origin. The retroperitoneal sarcoma has a capsule, is lobulated, and in the beginning is hard and dense. Degenerative changes are liable to occur. Hemorrhages may take place into the tumor, and even a puriform condition may arise. By these changes the growth may assume a cystic character. Metastasis is not very likely to occur, but when it does, it is most usual in the liver and lungs. The intestines are very apt to become attached to and involved in the growth, and cystic areas in the growth may empty themselves into the intestine. A retroperitoneal sarcoma begins insidiously, and the first evidences of trouble usually are gastro-intestinal disturbances. The earliest characteristic symptoms are due to pressure upon the lumbosacral nerves and upon the vessels which collect the blood from the lower extremity—conditions which cause pain in the legs and edema of the feet. Later in the case there is cachexia and lumbar pain, and obstruction of the intestines, partial or complete. The physical signs are often uncertain. Such tumors are often mistaken for enlarged kidneys or for growths of the suprarenal capsule. The only certain method of reaching a diagnosis is to make an exploratory incision, but surgical removal is not really feasible.

G. Betton Massey¹ reports a series of cases of carcinoma and sarcoma treated by his method of **cataphoretic sterilization**. [We have absolutely no confidence in this very unscientific method of treatment. Even if we grant its efficiency, the limits of its application are uncertain, and it can not thoroughly remove all the diseased tissue or the lymphatic glands with the exactness which modern surgery demands and to which is due its remarkable success.]

E. Harding Freely² discusses the question of **operating for cancer in the aged**. He reports the case of a woman of 82 suffering from cancer of the breast on whom he successfully performed a radical operation. The woman recovered from the operation and lived 9 months. In thinking over this case he dwelt on the following questions: First, is it possible to remove the entire disease with a fair prospect of subsequent immunity? Second, if so, is the patient in a fit condition to stand the shock? Third, if the two preceding questions are answered in the negative, what will the subsequent history of the case be if left to run its own course? In other words, one must weigh the risk of shock and of recurrence after removal against the increase of the tumor, which would ulcerate, and the increase of pain, which opiates would cease to relieve. In his case he came to the conclusion that, in spite of her advanced years, it would be better she should run the risk of operation than be condemned to a life of suffering and a miserable death.

G. Betton Massey,³ in studying the **increasing prevalence of cancer** in the United States, says that at the present time there must be 100,000 victims of the disease in the country. The greater number of these individuals are attacked in the prime of life while in the possession of bodily powers.

¹ Med. Rec., April 7, 1900.

² Lancet, June 2, 1900.

³ Lancet, March 10, 1900.

Robert T. Morris¹ writes about **coccygeal dermoid fistulæ**. This subject has received comparatively little attention. Fistulæ have received less attention than cysts, although fistulæ are more common than cysts and funnel-shaped depressions are more common than fistulæ. These congenital defects are of frequent occurrence, especially the funnel-shaped depression over the coccyx. Less often, in examining large numbers of people we will find fistulæ extending from $\frac{1}{2}$ inch to 4 inches, the deepest portion of the sinus being situated in the connective-tissue layer between the sacrum and the skin. The encapsulated cyst is rare, is small in size, and is probably frequently overlooked. Fistulæ and cysts contain lanugo-hairs, and occasionally the hairs are nearly 3 inches in length, straight, and welded into a cylindric mass by sebaceous matter. Sebaceous material escapes from the fistula, decomposes, and gives rise to a disagreeable odor. In the funnel-shaped depressions it often dries upon the skin and comes away in the form of scales. These cases, of course, represent embryonic defect, and it is possible that the tail of the embryo in undergoing involution leaves a portion of skin endowed with embryonic latent cells; the skin around the seat of the embryonic tail develops more perfectly and encapsulates the remains of this structure, so that a coccygeal fistula is really an inverted tail. In treating these cases of fistula the entire wall must be taken away. This wall consists chiefly of embryonic tissue, and if any portion even is left, the fistula will recur. Treatment with silver nitrate is useless. Morris reports a case in which he effected a cure by dissecting out the fistula.

G. P. Newbolt² reports a case of **multilocular cystic epithelial tumor of the jaw** which curetting failed to cure and which required excision of half of the lower jaw.

Charles N. Dowd³ writes on the submaxillary part of the **operation for epithelioma of the lip**. It is cause for surprise that the lymph-glands beneath the jaw are not more generally removed for cancer of the lip when we recall that the lymph-glands of the axilla are almost universally removed for cancer of the breast. It is still very common to remove a lip cancer and not to remove the glands beneath the jaw. There are two possible explanations of this neglect: It is known that many cases are cured by a simple operation on the lip alone, and it is a general belief that the glands beneath the jaw can be felt if they are infected. With regard to the first proposition, whereas it is true that many cases have recovered when the glands were not removed, many cases have died because they were not removed. With regard to the possibility of palpating diseased lymph-glands, it is true that in the majority of cases this can be done; but in order to do it with accuracy if the glands are small, one finger must be placed within the mouth and one externally so as to obtain counterpressure, and the proper regions must be examined; and, again, in some cases in which even this method fails to detect enlargement of the glands, diseased lymph-nodes will be found when the neck is opened with a knife. There are three regions

¹ Ann. of Surg., March, 1900. ² Lancet, Jan. 6, 1900. ³ Med. Rec., Dec. 23, 1899.

in which the lymph-glands are particularly liable to become involved in cancer of the lip: First, above the front portion of the submaxillary salivary gland; second, the space between the anterior bellies of the digastric muscles; third, the space beneath the border of the jaw about the posterior portion of the submaxillary salivary gland.

In operating, if the surgeon finds that the submaxillary lymphatics are extensively involved, he should always examine the region of the internal jugular vein. The incision should be made beneath the margin of the jaw, parallel with the border of the jaw. The knife divides the skin, the superficial fascia, the platysma myoides, and the deep fascia. The myohyoid muscle is drawn forward, the margins of the wound are retracted, the submaxillary gland is drawn downward to expose its upper and anterior surface, and the glands lying above it are removed. The salivary gland itself is rarely infected, but if it is found to be, or if the glands are adherent to it, it should be removed. The posterior end of the wound should then be retracted and the tissues beneath the margin of the jaw should be examined carefully. Any enlarged nodes should be removed. After this, the retractors should be inserted in the anterior portion of the wound; the dissection should be carried forward to the space between the anterior bellies of the digastric muscles, and the submental lymph-glands should be removed. If the lymph-glands beneath the jaw are found to be infected, the upper lymphatics along the internal jugular vein should be examined; and if these are involved, they must be removed, and also the lower portion of the chain. The lower portion of the chain is reached after making an incision in the line of the carotid. [We have more than once found enlarged glands after opening the neck when palpation previous to operation failed to detect any. We believe the glandular area beneath the jaw should always be removed in cases of cancer of the lip.]

Xavier Delore¹ says that **congenital dermoid cysts of the floor of the mouth** develop at the expenses of the encloisement (enclavement) of an ectodermic surface, between the two first branchial arches and the tuberculum impar, while most of the mucoid cysts derive from the thyreoglosse tractus of His. Whatever is the pathogeny, the tumor situated near the median line makes a projecture at the level of the subhyoid region, more in the floor of the mouth, or still at both sides at the same time. In the first case it is usually adherent to the hyoid bone (adhyoid cysts of Gérard-Marchant); in the second case it rather adheres to the geni apophyses of the inferior maxillary (adgenicus cysts), and often, too, at the hyoid bone. According to its situation in the tongue, in the buccal floor, or in the cervical region, the cyst gives different clinical evidences. The cyst he presented, taken from the clinic of Prof. Poucet, is a type of that variety described by the authors under the name of congenital salivary cyst. Histology has shown that most of them are of congenital dermoid nature and have no connection with the salivary glands.² In clinics, the distinction between a sublingual salivary cyst

¹ Gaz. hebdom. de Méd. et de chir., Mar. 8, 1900.

² Faure, Thèse de Lyon, 1893.

(grenonilette sublinguale) and a dermoid cyst is not always easy. The congenital origin is often unsuspected when the teratological disposition becomes apparent a long time after birth, as we have observed it in that case of Poucet, in which the cyst only revealed its presence between the age 38 or 39. The treatment is complete extirpation of the membrane; if this is not done there will be regrowth. The median subhyoid incision has the advantage of perfect asepsis; it allows the easy resection of the portions adherent to the hyoid bone, but makes an ugly scar; the transhyoid route gives a large operative field toward the tumors included in the base of the tongue. The buccal route is certainly to be preferred if the cyst is preeminent in the buccal cavity. Something is better than a slight visible scar, said Quénu to the Société de Chirurgie, is to have no scar at all. Poucet advises to make a counteropening for drainage above the hyoid in order to avoid all kind of retention. That observation shows that you can remove large tumors by the buccal route, even with extensive prolongation, adherent to the inferior maxillary or even to the hyoid bone, without exposing your patient to recurrence due in-complete removal.

C. Trunczek¹ maintains that under certain conditions **arsenic** gives a reaction of a positive nature with cancerous material, and that arsenic will cure some varieties of epithelioma. He is a strong advocate of the arsenic treatment, and reports some cures that have been obtained by it.

A. Ravogli² advocates the **use of formaldehyd** in treating certain cases of superficial cancer of the skin. The best plan is to curet away the portion of the growth and then to apply the formaldehyd.

Dr. Scanes Spicer and Mr. H. Stansfield Collier³ reported a case of **sarcoma of the carotid sheath** in which they removed the growth with portions of the carotid arteries, internal jugular vein, and pneumogastric nerve. The patient recovered. The carotid artery and internal jugular vein were ligated above the clavicle and also at the level of the hyoid bone, and the tumor, together with the vessels, was removed. There was no respiratory disturbance until the parts on the cephalic side of the tumor were attacked, at which time the breathing became infrequent and shallow, and as the pneumogastric nerve was being isolated, respiration ceased. It was necessary to make artificial respiration for 2 minutes. During this condition of cessation of respiration there was an irregular, rapid, and very weak pulse. A great deal of shock attended the operation, but the patient soon rallied and made an uneventful recovery, and there was no apparent alteration in the visceral functions. The authors publish a table of 13 reported cases of tumor in which operation involved the sacrifice of all the structures in the carotid sheath.

J. Shelton Horsley⁴ reports a case of **large diffuse lipoma of the neck** upon which he successfully operated. He made the Kocher incision, commencing under one ear, passing over the tumor obliquely to a corresponding point on the opposite side of the neck. At the median

¹ Med. Rec., June 2, 1900.

² Lancet, Aug. 5, 1899.

³ Jour. Am. Med. Assoc., Nov. 18, 1899.

⁴ Phila. Med. Jour., July 8, 1899.

line this was joined by a vertical incision downward. Flaps were lifted and the entire tumor was exposed. Every bleeding vessel was promptly seized with artery forceps. The tumor was enucleated from the left side and dissected from the right side. It was adherent to the internal jugular vein of the right side, and the vessel was wounded in effecting removal, the wound requiring lateral ligation. After enucleation all clamped vessels were ligated. A gauze drain was inserted and the wound

was closed. The patient made an excellent recovery.

J. D. McFeely¹ advocates the injection of formalin in certain cases of inoperable malignant disease, and reports a case of epithelioma of the larynx and neck in which he used it. His conclusions are that any amount up to $\frac{1}{2}$ of a dram of pure formalin can be injected into the tissues of the body without causing toxic symptoms. It is an active styptic, but is not so likely as other styptics to cause clotting or embolism. The undiluted formalin is probably as safe as the diluted agent. If used undiluted, it produces an effect more quickly. Al-



Fig. 6.—Horsley's case of diffuse lipoma. Appearance of patient prior to operation (Horsley, in Phila. Med. Jour., July 8, 1900).

most all powerful antiseptics or irritants stimulate cell multiplication in malignant tumors; formalin, on the contrary, retards cell multiplication. Formalin is a powerful antiseptic and exercises a destructive influence on low forms of animal life.

Jonnesco² has devised an operation for the extirpation of malignant disease of the tonsils. In the case in which he applied it, there was

¹ Brit. Med. Jour., July 29, 1899.

² Bull. et Mém. de la Soc. de Chir. de Bucarest, March, 1899.

a malignant growth of the right tonsil and the posterior pillar of the fauces. A preliminary tracheotomy is always performed. He makes an incision about 4 inches in length behind the vertical ramus of the jaw, which incision reaches to the level of the superior border of the larynx. Another incision is carried outward from a point about one finger's-breadth below the chin to the first incision just back of the vertical ramus of the jaw. The external carotid artery is exposed and a ligature is tied around it. The lower jaw is sawed between the first and second molar



Fig. 7.—Horsley's case of diffuse lipoma. Appearance of patient prior to operation (Horsley, in *Phila. Med. Jour.*, July 8, 1900).

teeth after the muscles have been separated from it in this region. The outward dislocation of the temporomaxillary joint is then brought about. Division of the outer wall of the pharynx exposes the diseased tonsil. The diseased structures are now removed, the surgeon being desirous, if possible, of saving the anterior pillar of the fauces. If it is found possible, the wound in the pharynx should be approximated by means of sutures. The fragments of the jaw are now brought together and sutured or held by a wire around the teeth. The external wound is

sutured, space being left for drainage. The lumen of the pharynx above the tracheotomy tube is kept plugged with antiseptic gauze for several days, and the tracheotomy tube is not removed until the area of operation has completely cicatrized. The author claims that the use of both a vertical and a horizontal incision permits him through one wound to tie the external carotid artery, to remove the tonsil and adjacent structures, and to take away any involved glands. The division and luxation of the lower jaw give him free access to the site of disease and do not cause subsequent deformity.

Downie¹ reports 2 cases of **primary sarcoma of the tongue**. One case was of the pedunculated form and the other was an interstitial growth. In the first case the discomfort which attended the onset of the growth was thought to be due to catarrhal inflammation of the throat. In the second case it was thought to be due to injury. In the pedunculated growth the tissues of the tongue were not deeply involved; in the interstitial growth they were. The pedunculated variety grew very rapidly, but was not associated with edema. The interstitial form grew much more slowly and was associated with edema of the tongue. In the pedunculated growth the disease was limited to the tongue. In the interstitial growth secondary growth was not reported.

Chavannaz² reports the case of a woman upon whom he operated for **sarcoma of the left superior maxillary bone**. Almost 3 years after this operation a nodule of disease was found on the sixth rib of the left side. The patient would not allow removal at this time, but after several months the tumor had grown considerably and had become painful, and a spontaneous fracture of the rib had taken place. The surgeon resected the diseased rib and adjacent muscular tissues. On lifting the rib outward a whistling sound was instantly detected which occurred with the movements of respiration. This was produced by a tear in the pericardium; the tear was found and sutured. For a few days subsequent to the operation a precordial bruit could be detected, which was heard most loudly at the apex. This patient recovered. The author believes that the precordial bruit was due to friction of the catgut sutures, although he thinks it could have been produced by blood-clot.

Estella M. Riley³ reports a case of **congenital inguinal telymphangioma** of large size, and makes some remarks on the congenital tumors of childhood. The patient is 12 years of age. When she was born, she presented in the right inguinal region a white tumor as large as a fetal head, ovoid, and in some parts blue veins being discernible. From time to time since birth the child has had spasms. When the infant was a month old, the tumor commenced to grow, and increased rapidly in size. When the child was 3 months old, the tumor became of a dark livid color for a time. Hemorrhage first occurred when she was 2 years old, owing to the pressure of the growth upon the superficial veins. The openings always healed without trouble after the

¹ Br't. Med. Jour., Oct. 21, 1899.

² Rev. de chir., Aug., 1899.

³ Ann. of Surg., Nov., 1899.

hemorrhage ceased. The child has never felt well, has suffered from violent headaches, and has frequently had elevated temperature. In some of these attacks her life has been despaired of. When an acute attack comes on, the tumor is enlarged, the body-temperature is raised, and she becomes delirious. She is very anemic. About a year ago a discharge began from the tumor. This discharge occasionally dries up; and when it does so, the patient suffers from nausea, but is relieved when the ulcers open again. The discharge is serous in character and is sometimes mixed with blood. The lower portion of the tumor is reddish in color and is covered with dark, rounded crusts on whose surface the bloody discharges ooze. On the upper part of the tumor is a superficial venous telangiectasis, and scattered over this area are black, raised masses, which crumble off like cinders. This case is, of course, inoperable.

Albert I. Bouffleur¹ reports a case of successful removal of a **fibrosarcoma of the abdominal wall** involving the iliac vessels. In this case it was necessary to remove a portion of the external coat of the iliac artery.

M. Duret² presented 2 **adenomas or painful tubercles of the breast** removed from a woman 40 years of age. That woman had in the left breast a nodosity (tumor) as large as a pea, mobile and very painful, causing crises of neuralgia which radiated toward axilla. Often during menopause, little adenofibromas, which are very painful, undergo epithelial transformations.

Frank E. Buntz³ reports a case of **diffuse hypertrophy of one breast**. The patient was a girl 19 years of age. The left breast was greatly hypertrophied and the right breast was somewhat atrophied. The enlargement had begun 4 years before. Buntz removed the breast, leaving the nipple. This case was rare, because it was diffuse and was not circumscribed, because it was unilateral, and because there was no apparent disease or difficulty with the generative organs.

Duchamp⁴ reports a case of **fibrosarcoma of the right breast** which attained a great size. The patient was a woman of 24. The growth had appeared when she was 21. It had grown but little in the first few years, but had recently taken on very rapid growth. The other breast was not diseased. The axillary glands presented no detectable enlargement. She suffered from menstrual irregularities and scantiness, which had come on since the appearance of the tumor. The growth did not adhere to the pectoral muscle and was easily removed. Examination showed it to be a fibrous sarcoma undergoing myxomatous degeneration. Two years after operation recurrence took place in the cicatrix. The woman refused reoperation and soon died.

E. C. Brush⁵ reports a case of **cancer of both breasts**. The patient was a woman 56 years of age. She presented herself with a cancer of the breast which she had observed 4 months before. A radical operation

¹ Ann. of Surg., Nov., 1899.

² Gaz. hebd. de Méd. et de chir., Feb. 8, 1900.

³ Cleveland Med. Gaz., Sept., 1900.

⁴ Loire méd., Nov. 15, 1898.

⁵ Cincin. Lancet-Clinic, Oct. 7, 1899.

was performed and the patient promptly recovered. Some 4 months later a tumor was found in the other breast which was not present at the time of the first operation. A radical operation was performed on the other breast. Recovery followed.

Maass¹ has employed **Assaky's method** of bringing together the margins of the wound left by radical removal of the breast. He makes a transverse incision above and below the gland of the opposite side, lifts the gland from the muscle below it, draws it beyond the middle line, and utilizes it to close the gap, the nipple being about in the center of the body. In order that the flap shall retain its nutrition the external mammary vessels from the axillary artery must not be injured and the supply of blood is generally plentiful, although in some reported cases there has been a little necrosis of the margins of the wounds. This operation permits of immediate closure of even a very large wound.

The Lettsomian Lectures for 1900, delivered by Sir William Banks, of Liverpool, consist of **practical observations on cancer of the breast.**² He reviewed in the most instructive manner the existing knowledge of the subject, discussing the general value of statistics, the local distribution of cancer, the cause of the increased death-rate from cancer, the paramount importance of early diagnosis, and many other facts. He discusses at length the operative procedures in mammary carcinoma, shows the inadequacy of the older operations, and considers the step in advance which was taken by Moore, of London, by the younger Gross, by himself, and by others. Banks says that he has removed the breast and cleaned out the axilla over 250 times. He does not consider it necessary, as does Halsted, to remove the entire great pectoral muscle and to divide the lesser pectoral in order to expose thoroughly the axilla. He has abandoned all hope of benefit by clearing out the supraclavicular region. In former days, when he had a notion that he could remove any cancer, he performed this operation a number of times. He does not say that he will not do it again if a suitable case occurs, but he thinks it is very rarely of the slightest service. Banks thinks that when a cancer has attacked the supraclavicular glands, it is practically past extirpation. He agrees with Bennett May in his judgment that it is very doubtful whether some of these modern extensive operations give an additional immunity from recurrence which is at all commensurate with their safety. Certain it is that in both classes of cases the majority of fatal results are due to internal metastasis without local recurrence, and against these no operation can protect. He also agreed with Matas in the statement that surgery has reached, or almost reached, its maximum effectiveness, beyond which it can not advance without great risk to life or with any further expectation of increasing the chances of permanent cure. He agrees with Marmaduke Shield that the pendulum of surgical opinion toward extensive operation has gone too far. He says that he has never seen recurrence arise in the space between the great and the lesser pectoral muscles. If the great

¹ Practitioner, Jan., 1900.

² Brit. Med. Jour., Mar. 10 and April 7, 1900.

pectoral muscle is the seat of a recurrent growth, it creeps into it from the subcutaneous tissue and pectoral fascia, and does not originate primarily in the muscle. There is, therefore, no need for the removal of the muscle on that ground. As a matter of fact, no one lives long after a distinct invasion of the supraclavicular glands. He utterly disbelieves in Berger's suggestion that in severe cases the entire upper extremity may be removed. Banks never makes an angular, a triangular, or a multiangular incision. He draws a circle with a knife outside of the apparent limits of the mamma if the tumor is central, and bulging well beyond the growth if the tumor is lateral. He then undercuts the skin for 2 inches all around it and begins the removal of the breast where the undercutting ceases. In this manner one gets a long way beyond the rough limits of the gland. Then the tumor is removed and the fascia is dissected off the great pectoral muscle. The undercutting permits one to get the fascia off the muscle as far inward as the sternum, as far outward as the ribs, and as far upward almost as the clavicle. The axilla is then opened by an incision under the margin of the great pectoral muscle and the upper end of the mammary gland, and the whole contents of the axilla, as far as they can be held together, are carried away in one mass. This is important because axillary recurrences take place, for the most part, not in glands which are left behind, but in the fragments of the lymphatic vessels. The surgeon should endeavor at the beginning of the process to expose the axillary vein. On no account does he accept Halsted's advice, and use the sharpest possible knife. In fact, he does not use a knife, but a dissector, dissecting forceps, and curved, probe-pointed scissors. A drain hole is made just above the edge of the latissimus dorsi muscle. It is remarkable what can be done toward pulling this large wound together by the use of strong wire and lead buttons. The top of the axillary cut should be kept open, a piece of gauze being introduced into this aperture and another piece into the drain hole below. He washes his hands well with hot water and soap before operating, pours hot water constantly over the wound during the operation, and after the completion of the procedure sees that all bleeding has ceased. He uses no disinfectant fluids, and dresses the wound with a piece of bichlorid gauze and a pad of absorbent wood-wool. He is persuaded that skin is the really dangerous tissue in the matter of cancer of the breast. If it is necessary to remove so great an amount of skin that a large wound is left uncovered, Thiersch grafts can be employed, either at the time of the operation or after granulation has begun, and he prefers the latter plan to the former. He does not believe that there is any danger of infecting the wound with the knife that has made an extirpation incision through the tumor. He then publishes the statistics of 213 cases, of which 175 are available for statistical comparison. In Series 1, of 67 persons who died of local recurrence, 17 lived between 3 and 10 years. Series 2 shows 38 persons alive and well between 3 and 21 years after the operation. He says that in performing the operation we need not speculate on the possibility of internal recurrence, for our business as surgeons is to see whether we can not eradicate the disease

locally, so that patients who apply early may be given a good prospect of future immunity. Out of 175 patients, 108 have remained free from local recurrence; and of the 108, 83 have lived over 3 years; 40 cases lived between 3 and 6 years; 28 cases, between 7 and 14 years; and 5 cases between 16 and 21 years. Take from these cases half a dozen in case of error, and it still follows that for every one of the 67 failures he can put against it a case in which the patient remained free from 3 to 21 years. As for the three-year cure system, it must be abolished if people are to be instructed fairly. Let no woman be reckoned cured of cancer of the breast until she is dead.

Heurtaux¹ reports a case in which **secondary carcinomatous nodules** appeared 30 years after the operation for cancer of the breast. The woman's breast had been removed and the axillary contents had been cleared out 30 years before, when there appeared in and about the scar in the axilla, and finally in the thorax and vertebræ, nodules of carcinoma, and these secondary deposits grew with great rapidity. The author maintains that they were secondary and not the development of new carcinoma.

ANESTHETICS.

At a meeting of the London Society of Anesthetists² a discussion was carried on as to the **after-effects of ether-inhalation** upon the respiratory system. Mr. Sydney Rumboll stated that in 1500 cases of ether-inhalation in which the ether was preceded by gas there had been 1 case of bronchitis, 1 of pneumonia, and 4 of trifling bronchial irritation. In 60% of his earliest cases and in 30% of the later cases there was decided increase of the salivary and bronchial secretions, though these conditions were quickly relieved by vomiting. The cases were not selected. All sorts of operations were performed. Some of the patients had albuminuria, 4 had glycosuria, and several had cardiac disease. He maintained that the less ether used, the better. The operating room should be at a temperature of 70° F. and great care should be taken to prevent exposure of the patient. Catarrhal conditions of the air-passages should be permitted to subside before an operation requiring ether is performed. It is the belief of Mr. Rumboll that the bronchitis cases which are quoted were due to cold taken in the operating room. Pneumonia was supposed to be due partly to septic infection. Mrs. Stanley Boyd reported 6 cases of respiratory trouble; 1 was lobar pneumonia, 1 was bronchopneumonia, and 4 were bronchitis. Mr. Starling reported a case of ovariectomy in which the patient died in 36 hours from bronchitis and pulmonary edema, and he said that respiratory complications were most likely to occur after abdominal operations. Miss Blake stated that in 1250 administrations in the Royal Free Hospital there were 3 instances of pulmonary trouble. In one case the preexisting signs of phthisis were markedly increased. In a case of the radical

¹ Arch. Prov. de Chir., No. 2, 1899.

² Brit. Med. Jour., Feb. 10, 1900.

cure of hernia rusty sputum was noticed 3 days after operation, and in a case of injury to the chest pneumonia followed. [It is our experience that respiratory complications occasionally, but rarely, follow the administration of ether. The more carefully ether is given, the more rarely will such conditions be encountered. In a hospital in which there is no professional anesthetist, and in which the giving of the ether is intrusted to a resident, respiratory complications are more common when the resident is "green" than when he has had some experience. Bronchopneumonia is met with in septic conditions far more often than in other states, and is especially common when there is a septic condition of the mouth, tongue, or pharynx. A cold caught by transferring a patient from a warm operating room through a cold hall or to a cool bedroom may chill the patient and produce a bronchitis, and this bronchitis may be wrongly attributed to ether.]

S. Ormond Goldan¹ reports an unprecedented case of **prolonged anesthesia with nitrous oxid and oxygen**. Both breasts were extirpated, both axillæ were cleared out, and the patient was kept in the anesthetic state for 2 hours and 40 minutes. [The use of nitrous oxid and oxygen is satisfactory only when given by a skilled anesthetist. As Buxton says in his work upon "Anesthetics," "success in the use of this method can be obtained only by the most careful attention to carrying out its details." Buxton remarks further: "Experience alone can enable the administrator to regulate the amount of oxygen required for any given case. It should be remembered that the addition of oxygen is simply made to enable a patient to go on breathing nitrous oxid without suffering from oxygen starvation. In other words, oxygen is an adjunct and not an adjuvant anesthetic like ether" ("Anesthetics," by Dudley W. Buxton).]

H. W. Carter² discusses the subject of **nitrous oxid and ether anesthesia**. He says that in the United States the common method has been to give the nitrous oxid through the ordinary dental apparatus, and when the patient has been anesthetized, to give ether on a separate inhaler. In England they use a combined gas-and-ether inhaler, and this method is greatly preferable. Carter uses the apparatus of Bennett, of New York. In nitrous oxid and ether anesthesia it is not desirable to give the gas to a degree where the patient develops stertor, jactitation, etc. Carter describes Bennett's apparatus. If the patient is very nervous, he gives a small amount of morphin hypodermically 15 minutes before giving the anesthetic, maintaining that it allays nervous excitement, stimulates the circulation, prevents postoperative pain, and diminishes shock. We should remember that an idiosyncrasy may exist, and should make inquiries beforehand to determine whether it does. The anesthesia by nitrous oxid is usually complete in from 2 to 3 minutes, and then the gas inhaler may be resupplied from the ether-chamber, the ether-bag is attached, and ether is added. A guide to the proper depth of the anesthesia is the respiration, and respiratory difficulties are the chief dangers.

¹ Med. Rec., Mar. 3, 1900.

² Med. Rec., April 14, 1900.

A. Ernest Gallant¹ writes a valuable article on the subject of **etherization**, and shows how, by proper administration, the amount of ether necessary can be very greatly reduced. He says that it is desirable, when feasible, to prepare the patient during the course of a week, to ascertain the condition of the kidneys, to evacuate the intestinal tract, and to give a 12 hours' rest before operation in order to lessen painful peristaltic movements which are liable to follow the handling of the viscera often necessary in abdominal operations. The food given during this period depends on the activity of the digestive function and upon the patient's general condition. Digestion often ceases for 24 hours before operation because of nervousness. An effort should be made to secure a good night's sleep before operation, and this will often follow a hot ammonia bath and a rub with diluted alcohol. The condition of the heart and pulse should be ascertained before operation in order to determine the effect of the anesthesia upon the circulation. The choice of the anesthetic depends upon the study of the heart and lungs and upon the individual judgment of the surgeon. The safest anesthetic for diagnostic examinations and trivial operations is nitrous oxid. It is not only the safest, but the most agreeable, and the action of this agent can be continued for from half an hour to an hour. It is an admirable drug for the induction of anesthesia before ether is given. The rapid method of giving ether should never be followed. The aim of the anesthetizer must be to maintain uniform anesthesia with the smallest possible quantity of ether, and to avoid nausea, vomiting, and shock. The best **inhaler** is the modified Allis' inhaler, a gauze diaphragm being adjusted over one end, the cavity filled with gauze, and the cone so adjusted that there is considerable air space above and no air space below the frame. During the administration the anesthetist's right hand should support the chin in order to prevent relaxation of the jaw and dropping backward of the tongue, and the left hand can fold in the top of the cone to increase the amount of ether which is inspired. Ether in dram doses can be added at frequent intervals without removing the cone. The admixture with plenty of air prevents saturation with ether vapor, the gauze diaphragm prevents vomiting into the cone, and in long operations the loose gauze may be replaced. The degree of anesthesia must be sufficiently deep to abolish sensation and to relax the voluntary muscles, and this is known as the surgical degree. For instance, in an abdominal operation it is necessary that the recti muscles be relaxed. It is well to place the patient on the operating table before giving the anesthetic. False teeth, finger-rings, and ear-rings are removed, and the patient is placed upon his back with a pillow under the head, the pillow being just high enough to raise him to a comfortable position. The pillow should not be under the shoulders. Before bringing the cone near the face direct the patient to take a number of long breaths, so that he will become accustomed to the effort of inflating the lungs. Saturate the gauze in the cone with ether, and in order to reassure the patient and show him the method, the anesthetizer places

¹ Med. Rec., Dec. 30, 1899.

it close to his own face and takes a long, deep inspiration. Hand the cone to the patient and persuade him to bring it nearer and nearer to his face, and if he says that it is too near, tell him to blow away the vapor. By blowing it away he will make full expirations and inspirations and will inhale quantities of ether. In 2 or 3 minutes the hand upon the cone will begin to relax, and the cone is then taken by the anesthetizer and held close to the face, the top of it being folded in. By applying his nose from time to time to the corner of the cone the anesthetist can gauge the quantity of ether in the cone. The anesthetist should take a seat at the head of the table and should rest an elbow on each side of the patient's head to prevent turning of the head. If a patient struggles, he can be held to the table by an assistant placing one hand on each arm above the elbow and throwing his weight upon the arms. If there are two assistants, put one on each side of the table, and each assistant puts one hand on the patient's shoulder and the other hand on the arm just above the elbow. Struggling should hasten anesthesia. Gallant then discusses the accidents of anesthesia, their prevention and their treatment, and the after-care of the patient. [This is a very valuable practical article, and points out many of the almost innumerable things an anesthetist should know. The administration of an anesthetic is an art, and to become skilled one must have natural aptitude; some men, in spite of much experience, never become reliable.]

A. P. Ohlmacher¹ maintains that in the condition of lowered vital resistance known as the lymphatic constitution there is a strong tendency to sudden death while under the influence of anesthesia.

James Edmunds² discusses **deaths under chloroform**. He says that the anesthetist must see that the patient is anesthetized with every possible provision for recovery. There were inquests on 83 persons killed by anesthetics in England in 1899, and of these, 68 were killed before the operation was commenced. We know that there is a tendency to have as few inquests as possible after such deaths, and often the reports of such inquests are suppressed. It may be justly estimated that some 200 persons were killed by anesthetics in England during the year 1899. Edmunds claims that in administering chloroform we must try to give precise doses, just as we try to give precise doses when we administer morphin or strychnin. We do not think it proper for a druggist to guess at the amount of strychnin, and we insist that hypodermic syringes shall be graduated. Chloroform vapor is certainly a powerful poison, and it needs to be administered with precision and not by rule-of-thumb methods; a true volumetric discharge can now be given by the improved Krohne inhaler. Deaths with cyanosis are certainly due to asphyxia. They are caused by the inspiration of air saturated with chloroform vapor. Spasm of the glottis, resistance, rigidity or struggling, spasm of the respiratory muscles and of the diaphragm, with spasm of the myocardium, are all provoked in varying degrees by the inspiration of air saturated with chloroform. The patients die of asphyxia complicated by angina, which attacks the heart as cramp

¹ Phila. Med. Jour., Mar. 10, 1900.

² Lancet, Jan. 27, 1900.

affects the calf of the leg. If the patient does not die suddenly and chloroform is pushed, there is paralytic relaxation of the glottis, and this is followed by deep inspirations of surcharged air, just as in some cases of drowning mud and water are drawn into the lungs. We know that occasionally a patient will be brought from the water with the heart still beating and the chest-movements going on, and yet resuscitation can not be accomplished by artificial respiration. In such cases, at the autopsy water is found in the bronchial tubes. When taken out of the water, these cases may be recognized by the fact that, though the patient is breathing, foam issues from the mouth and nose. Such cases are rarely resuscitated. In **chloroform-poisoning**, after the paralytic relaxation of the glottis the saturated air enters the bronchi, surcharges anew the cardiac pulmonary blood, and fills all the recesses of the air-passages. The end-organs of all the respiratory nerves are poisoned by the local action of the chloroform, while the charged blood poisons the myocardium and its nerves. All this may take place in half a minute if chloroform is pushed after resistance has been provoked. Whereas if time had been given for the diffusion of the chloroform through the system, it would not even have produced anesthesia. It is not the total amount given; it is the local surcharge—the concentrated action. Waller has shown that below a 5% vapor volume of chloroform and air nerve-function is arrested, but resuscitation is still possible. A 6% vapor kills the nerve and resuscitation is not possible. Four minims of chloroform may be considered as 4 cubic inches of chloroform vapor. For a 6% charge this 4 cubic inches of chloroform vapor would saturate the mass of cardiac pulmonary blood and myocardial tissues. Hence these cases can not be saved by artificial respiration. If the Krohne inhaler is used, the **vapor volume of chloroform** is 4%. The safe exhibition of chloroform depends upon beginning with small volumes of chloroform air for each inspiration, and this provokes neither cough, resistance, nor spasm of the glottis. Edmunds watches closely the phenomena of the anesthesia, and knows at what point he is to regulate the amount of chloroform and air injected for each inspiration. He thus uses two guides—observation and dead reckoning.

Cosimo Noto¹ advocates the association of paraldehyd with chloroform in the production of **mixed anesthesia**. Nussbaum, during an operation, being afraid of prolonging the chloroform narcosis, gave a hypodermic injection of morphin and saw the narcosis that had faded away reappear; and we know that Bernard, by giving morphin before chloroform was administered, demonstrated that a prolonged operation could be done with much less chloroform. The administration of morphin before chloroform or of morphin after chloroform constitutes what is known as mixed anesthesia. The giving of morphin before chloroform is of great service. It prevents or shortens the period of chloroform excitement and it abolishes the dangerous laryngeal reflex which may produce fatal syncope, but there are certain objections to the method. It adds to the liability of respiratory syncope; but

¹ New Orl. M. and S. Jour., Mar., 1900.

respiratory syncope, as a matter of fact, is not a serious danger to life, as it can be easily overcome by pressure on the chest. Morphin produces stupor, increases shock, adds to the lowering of the temperature, and increases the toxicity of the chloroform. These objections are so strong that attempts have been made from time to time to improve the mixed method of anesthesia. Spencer Wells proposed to add alcohol to the chloroform; but it was found that 30 parts of methyl-alcohol and 70 parts of chloroform, as given by Wells, still produced the dangers of chloroform. Forné substituted chloral for morphin to diminish the necessary dose of chloroform and to abolish the period of chloroform excitement; but chloral is a cardiac depressant, and it seems obvious that the dangers of chloroformization are increased rather than diminished by the use of chloral. Trelát and Perrier tried the association of chloral with morphin and of both with chloroform, but the objections which can be urged against this method have been previously cited. The following plans have been suggested: To associate nitrous oxid with ether (process of Clover); to associate alcohol with chloroform and ether (process of Stefani and Vacchetta); to associate cocain with chloroform (process of Obalinsky); and to associate acetic ether with chloroform (process of Von Mehling). Dastre and Morat propose to use atropin with morphin and chloroform. They hoped that this combination would prevent nausea and vomiting, would prevent salivation, and would paralyze the inhibitory branches of the vagus, thus avoiding the danger of reflex arrest of the heart. If it is true that the mechanism of chloroform-death depends on the transmission to the heart of an inhibitory reflex, then this mixture should be valuable, but clinical experience shows that its value is certainly doubtful. Many observers believe that cardiac syncope is due to the direct action of chloroform on the heart, and it seems probable that the number of deaths due to reflex action have been exaggerated. Langlois and Maurange, suggesting the substitution of spartein for atropin, maintain that spartein lessens the excitability of the pneumogastric nerve, removes atony of the heart as determined by chloroform or by the action of the vagi, favors the elimination of morphin and chloroform, and antagonizes the lowering of temperature; but there is no real evidence that spartein has been more successful than atropin; in fact, it has been actually maintained that spartein increases the excitability of the pneumogastric, and the action of this drug on the heart is changeable. The author has made a study of the dangers that are greater and that it is most desirable to avoid in cases of chloroformization. These dangers consist chiefly in great depression of the cardiovascular apparatus. Two ways seem to be open to the surgeon: one is to try to avoid, or at least to counteract, the injurious effect of the chloroform on the heart and circulation. The other is to combine with chloroform some drug which will make prolonged chloroform anesthesia safe, and which will not itself produce a harmful effect on the cardiovascular apparatus. To obtain the first point some drug of the pharmacologic group of digitalis is desirable, and he made a series of experiments with helleborin. He found that by giving helleborin before

beginning to give chloroform the lowering of the blood pressure under the influence of chloroform is much lessened, but the period of excitement is not modified at all; just as much chloroform is necessary to produce anesthesia as if helleborin had not been given. Therefore many of the objections to mixed anesthesia still exist when this combination is used. He decided to try paraldehyd, and his experiments have fully confirmed its usefulness. Paraldehyd does not injure the cardiovascular system; in fact, its administration facilitates the functions of this system. It does not lower the blood pressure, and may even slightly increase it. It does not alter the respiration. With paraldehyd the sleep is not ushered in by excitement. Its administration is not attended with salivation, vomiting, or any other disagreeable phenomena. This drug lessens or destroys cutaneous sensibility without the reflexes being affected, and the reflexes disappear only from a deadly dose. He finds that by associating paraldehyd and chloroform the period of excitement is suppressed, vomiting and salivation are prevented, anesthesia is rapidly produced and easily prolonged with a small amount of chloroform, there is no harmful influence, and there is even some advantage to the cardiovascular system.

Walter Lathrop,¹ who formerly strongly advocated the use of the **Schleich mixture in general anesthesia**, has now abandoned it utterly. He has come to the conclusion that it is both dangerous and unsafe, that the great danger is the sudden arrest of respiration, and that the chief action is on the respiratory centers. The patient recovers rapidly from the anesthesia, as a rule, but there is usually more depression following it than follows either ether or chloroform. The danger is not always great, but is likely to be sudden, and he warns the profession against its use. [Garrigues, who once advocated the use of the Schleich mixtures, has given them up.]

Kempton² advocates the use of **ethyl bromid** as an anesthetic in minor surgery. He maintains that if certain rules are adhered to, there is no danger. He states that in a series of statistics offered at the Berlin Surgical Congress there was 1 death in 2023 cases of chloroform anesthesia, 1 death in 5090 cases of ether anesthesia, and 1 death in 5228 cases of ethyl bromid anesthesia. He says that the full dose should be poured at once upon the inhaler. The full dose for a child is from 1 dram to 1½ drams, and for an adult from 2 to 3 drams. The inhaler is a crash towel, which is folded into an air-tight cone and which has about it a layer of paper to make it quite impervious. The base of the cone is sufficiently large to cover the mouth and nose. The patient is instructed to breathe deeply, the drug is poured into the inhaler, and the inhaler is placed over the mouth and nose, is held firmly in position, and is not removed until the patient is anesthetized. The anesthetization is usually complete in 1 minute. Under no circumstances should the inhaler be taken away in order to add more drug to prolong the anesthesia. A fresh preparation only should be used. The drug decomposes under the influence of light and air and forms very toxic products.

¹ Phila. Med. Jour., Dec. 2, 1899.

² Maryland Med. Jour., Sept. 2, 1899.

In most cases the pulse is not at all affected ; the color remains natural, the patient awakes suddenly and completely, and there is rarely nausea or vomiting. [It is not safe to give ethyl bromid over 3 minutes, as longer administration may cause failure of heart and respiration. Gandier gives ethyl bromid followed by chloroform.]

J. Blumfeld¹ writes on the **prevention of sickness** after the administration of anesthetics. He refers to the chief points to be attended to in order to prevent after-sickness : Use as little of the anesthetic as is consistent with complete anesthesia ; if much mucus has been swallowed, wash out the stomach at the termination of the operation ; in a prolonged operation substitute chloroform for ether after three-quarters of an hour ; move the patient as little as possible during and after operation ; after the operation, place him on his right side in bed with the head but slightly raised and give nothing but small quantities of hot, thin liquid for at least 8 hours, and do not alter the temperature of the room for a number of hours. If these precautions are taken, one-third of the patients will be free from sickness, and in short operations the proportion who will escape sickness will be much higher. In operations requiring 20 minutes or less, sickness will be the exception. [Inhalation of oxygen after an operation tends to prevent sickness, and so does inhalation of vapor of vinegar.]

Wiesner² advocates the use of ethyl chlorid as a general anesthetic in certain cases. The patient can be thoroughly anesthetized in from $\frac{1}{2}$ of a minute to 2 minutes, and there is no period of excitement, except in alcoholics. Respiration is not disturbed, the circulation is not depressed, and the tongue has no disposition to fall back. Consciousness returns promptly and vomiting is very rare. This anesthetic finds its chief field of usefulness in brief operations, but it has been used in operations which required nearly an hour to perform. It is particularly useful in a patient with circulatory trouble, fatty degeneration of the heart, and disorder of the respiratory system—cases in which it is improper to give chloroform or ether. It is also very useful for administration if operation is necessary in shock or after hemorrhage. When the patient is completely anesthetized, he may still, in some cases, be able to answer questions, although he will not remember the conversation afterward. It is common to find that the pupillary and corneal reflexes are not abolished. It does not cause complete muscular relaxation, and this, of course, lessens its usefulness in certain cases. There is one objection, and that is that the patient may regain consciousness during the operation.

James P. Tuttle³ writes on **ethyl chlorid in general anesthesia**. He states that the trade name of the preparation is **kelene**. In a case in which he gave it, there was complete anesthesia in 4 minutes, but there was no muscular relaxation. He changed the kelene for ether, and muscular relaxation was promptly obtained. He uses a graduated tube for the ethyl chlorid, which tube has a larger opening than that

¹ Lancet, Sept. 23, 1899.

² Wien. med. Woch., July 8, 1899.

³ Jour. Am. Med. Assoc., Mar. 24, 1900.

employed for local anesthesia. He covered the Esmarch chloroform mask with several layers of gauze and sprays the ethyl chlorid upon its inner surface. As soon as general anesthesia appears ether is substituted for the ethyl chlorid. In 4 of his cases the result was not favorable because analgesia was not produced by the ethyl chlorid. He has used it in 90 cases and has seen no unfavorable symptoms. In the combined anesthesia by ethyl chlorid and ether the quantity of ether necessary is very much reduced, the patient quickly recovers from the anesthesia, and nausea and vomiting are rare.

Galeazzi and Grillo¹ discuss the **influence of anesthetics upon the kidneys**. Their experiments consisted in the giving of methylene-blue and its detection in the urine. In healthy subjects the urine becomes colored in from 30 to 40 minutes. The most intense color is obtained in about 4 hours and the color disappears in from 50 to 60 hours. Ether and chloroform diminish the permeability of the kidneys, and the elimination of the methylene-blue takes place much more slowly. It is quite probable that anesthetics lessen the elimination of toxic substances, just as they lessen the elimination of methylene-blue.

Kemp² writes on the **effect of anesthetics on the kidneys**. He found that the administration of ether causes a rise in carotid blood pressure, this rise being followed by a fall. The urinary secretion is scanty and albumin appears in the urine soon after the commencement of the inhalation. Chloroform causes a slight and temporary rise of carotid blood pressure, followed by a marked and continuous fall. The secretion from the kidneys is copious and uninterrupted, and is lessened only when the general circulation is strongly depressed. Albumin is occasionally found, but only at a late stage and in small amounts. Nitrous oxid causes a very rapid and positive rise in blood pressure. He studied also ethyl chlorid and A. C. E. mixture. His conclusions are that ether causes contraction of the renal arterioles and injures the secretory cells of the kidney, and that kidney disease or edema of the lungs is a contraindication to the use of ether. He further states that before giving nitrous oxid to old people a hypodermic injection of nitroglycerin should be given in order to prevent the high arterial tension caused by nitrous oxid.

Reverdin³ believes that **death in anesthesia** is most liable to occur early in the administration because of irritation of the nose, which reflexly inhibits the respiratory center. He has invented an appliance which keeps the mouth open during anesthesia, and he gives the ether through the widely opened mouth.

Nathan Smilie⁴ advocates the use of **oxygen and chloroform**, believing that by the use of this agent there is less danger to the life of the patient; that it does not produce spasm of the glottis nor of the respiratory muscles, or cyanosis; that the circulation remains tranquil,

¹ Il Policlinico, Sept. 15, 1899.

² Bull. Acad. de méd., Oct., 1899.

³ N. Y. Med. Jour., Nov. 18, 1899.

⁴ Phila. Med. Jour., July 1, 1899.

and consequently there is less hemorrhage during operation than under ether; that postoperative nausea and vomiting are rare; that it can be given even in Bright's disease; and that it is the best anesthetic for tuberculous, syphilitic, and alcoholic patients.

Clement A. Penrose,¹ impressed by the difficulties of giving an **anesthetic in the knee-chest position**, has devised a new apparatus (Figs. 8 and 9, p. 48) which supports the patient in this position and admits of safe anesthesia.

W. H. Thomson² says that Dr. Kemp's experiments show that the inhalation of **ether can cause in healthy kidneys acute suppression** as complete as that produced by scarlatinal nephritis. Thomson therefore maintains that it is entirely unjustifiable to give ether to a person whose kidneys are not healthy. Such a person is likely to die on the table, as so many do from chloroform. Pulmonary edema with bronchial effusion and aspiration pneumonia are likely to occur. He states that chronic renal disease, or the presence of any of the signs of renal inadequacy, rigid arteries, high-tension pulse, and dilated heart with chronic bronchitis contraindicate the use of ether; and if any general anesthetic is to be employed, chloroform should be selected. No satisfactory explanation has been given which covers all cases of chloroform fatality. Thomson says that in his experiments with chloroform the only result was a uniform depressant action upon the heart, which was in no way different from the effects of other cardiac depressants; and yet, when chloroform kills, it does so in ways that seem special and not uniform. Sometimes the heart stops beating first; sometimes the respirations cease first; and there is no doubt that chloroform is at times a cardiac and at other times a respiratory paralyzer. In cases in which the respiration ceases first we have Richardson's epileptiform syncope—a condition in which there is tetanic rigidity of the respiratory muscles taking place before general muscular relaxation, causing interference with the pulmonary circulation, venous engorgement, and lastly stoppage of the heart. After general muscular relaxation has developed, death sometimes occurs suddenly from arrest of breathing, while the heart continues to beat; and there are those more usual cases where, after a few whiffs of chloroform, the patient turns deadly pale and the heart stops. Some cases of death during operation are due, according to Lauder Brunton, to imperfect anesthesia, the reflex effect of shock still being present and the anesthetic serving simply to depress the heart. Thomson knows of only one condition in ordinary medical practice in which he feels quite easy with chloroform, and that is when there is a regular, high-tension pulse. The fact that all general anesthetics are more or less dangerous imparts great interest to the recent improvements in the methods for inducing local analgesia. Local anesthetics could not supersede a general anesthetic in most operations, but they can in many, and no surgeon can afford to neglect the technical details of the methods.

¹ Johns Hopkins Hosp. Bull., Nov., 1899.

² N. Y. Med. Jour., Dec. 2, 1899.

Dr. G. H. Savage¹ read a paper before the London Society of Anesthetists on the relationship between the administration of an anes-

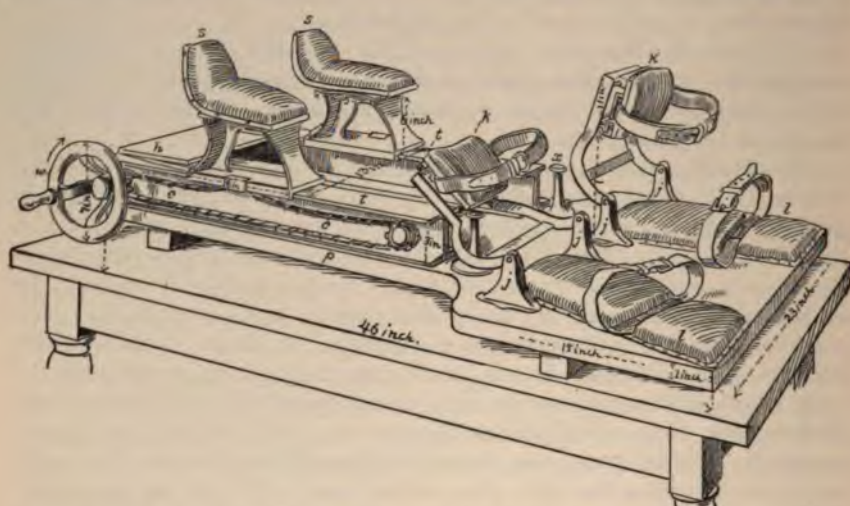


Fig. 8.—Apparatus for support in knee-chest position (C. A. Penrose, in Bull. of Johns Hopkins Hosp., Nov., 1899).

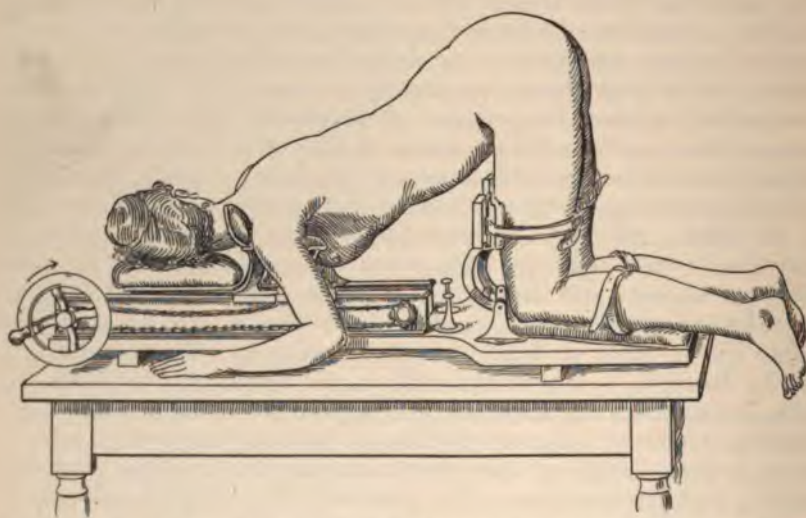


Fig. 9.—Apparatus for support in knee-chest position (C. A. Penrose, in Bull. of Johns Hopkins Hosp., Nov., 1899).

thetic and insanity. He showed that any drug which is capable of producing temporary mental disorder might produce lasting aberration.

¹ Brit. Med. Jour., Nov. 18, 1899.

Anesthetics are capable of producing delirium, and they may give rise to mania. They are capable of producing insensibility, and may cause stupor or mental confusion. They rarely produce insanity, except in persons who have had previous attacks or who are predisposed. The insanity might be due purely to the anesthetic, or might be due to the anesthetic and the operation. Dr. Savage does not think that one anesthetic has any greater power in producing insanity than another. He has seen acute mania follow the administration of gas for a dental operation. Simple melancholia and delusional insanity rarely follow the use of anesthetics, but stupor lasting for some weeks occasionally occurs, and there seems to be more risk of mental disturbance after the administration of an anesthetic if operation has been performed about the rectum or bladder. If patients are liable to recurrent attacks of insanity, the administration of an anesthetic is decidedly dangerous, and an anesthetic may redevelop mental symptoms that were passing off. There is little or no danger in giving an anesthetic to a person who is already insane. The administration of anesthetics as a method of treatment for insanity has failed in all cases. The sleep produced is transitory and of little service, and the patient on waking at once returns to the old level of excitement. In a few cases of extreme weakness following maniacal excitement an anesthetic is of temporary service.

Ernest J. Mellish¹ has presented a thorough study of **general surgical anesthesia and anesthetics**. His conclusions are as follows: "(1) Chloroform almost invariably kills by its effect primarily upon the circulatory system, and ether by its effect primarily upon the respiratory system. There probably are exceptions to both these rules; consequently hair-splitting discussions on this point are unpractical and useless. (2) In anemia of the medulla the patient should be placed in the head-down position. In sudden paralytic dilation of the right heart, as after several deep inhalations of chloroform, the heart should be rhythmically compressed by squeezing the chest; or the patient placed temporarily in the feet-down posture to empty the heart, artificial respiration being constantly maintained. (3) Anesthetics act directly or indirectly upon all the tissues, interfering profoundly with metabolism; and they tend to produce degenerative changes in the tissues, especially those of the vital organs. Of the anesthetics in general use, chloroform is probably most dangerous in this respect. (4) Deductions based upon laboratory experiments are likely to be deceptive, and should be accepted with the greatest caution as applicable to sick human beings, unless they agree with conclusions based upon clinical investigations. (5) As a rule, ether produces less circulatory depression than chloroform. It causes dilation of arterioles and increased capillary circulation, thereby insuring a good blood supply to the circulatory and respiratory centers and to the heart muscle; consequently these systems are in less immediate danger than with chloroform. (6) Cocainizing the nasal mucous membrane to antidote certain bad effects of anesthetics is not commend-

¹ Medicine, Nov., 1899.

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able practice. (7) On account of the reduction of body-heat by anesthetics, they should be administered in a warm room, and the patient should be protected from loss of heat so far as practicable by proper covering of the body, by application of artificial heat, and by protection from dampness of the skin. An excessively high room-temperature will do harm by adding heat depression to anesthetic—and operation—shock. (8) When properly administered, ether is no more liable to produce nephritis than chloroform, perhaps not so much so. The changes produced in the kidneys by ether, are, as a rule, temporary, while those caused by chloroform are likely to be more persistent. (9) Almost all the pronouncedly dangerous effects of ether, and to a less extent of chloroform, upon the kidneys are due to poor preparation of the patient, faulty administration, bad after-treatment, or all these combined. (10) Postanesthetic nausea is best prevented by preparation and after-treatment which favor normal physiologic tonus, with especial reference to the emunctories. Gastric lavage at the termination of anesthesia, followed by vinegar inhalation, will in the great majority of cases prevent serious disturbance from nausea. (11) The danger from hemorrhage is no greater with ether than with chloroform, perhaps not so great, since the bleeding which occurs from the effects of ether is primary and is more certainly provided against; while the circulatory depression and vasomotor constriction due to chloroform to a great extent prevent primary bleeding and lead indirectly to later hemorrhage. (12) The safety margin between sufficient chloroform for anesthesia and the lethal dose is much narrower than it is with ether. (13) Patients should be well fed with easily digested and nonbulky food to within a few hours preceding anesthetization, and should be allowed water to within 2 or 3 hours of it. If this plan is followed, shock will be less and elimination of the anesthetic will be more rapid, and with less harm to the emunctory organs. For the same reasons water should be given as liberally as practicable after anesthesia. (14) Machine methods in selecting anesthetics should be avoided so far as practicable, the anesthetic being selected according to the conditions present in the individual case. (15) Any anesthetic, but especially ether, should be given with the greatest caution in the presence of special susceptibility to acute bronchial or pulmonary affections. (16) Further clinical investigation in the use of nitrous oxid is desirable and necessary, in order to establish its status in relation to surgery; but its general employment is not practicable. (17) The majority of inhalers on the market are bad. An inhaler made on the principle of the Esmarch chloroform mask is the cleanest, safest, and best for ether as well as for chloroform. However, the 'open method' of administering ether is not practicable in the tropics, in high altitudes, nor in open-air military surgery, on account of too rapid diffusion. (18) The ordinary tongue forceps is a barbarous instrument and is often barbarously used. (19) The mouth-gag can usually be dispensed with; its use is often positively dangerous, from forcing the base of the tongue against the pharynx. (20) The post of anesthetist is second only in importance to that of the operator, and the

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selection of an anesthetist should be made with great caution when possible. *No person who has not a wholesome fear of anesthetics can be trusted to administer them.* Beware of one who believes any anesthetic to be 'perfectly safe.' (21) The anesthetist should gain the complete confidence of the patient as to his ability and carefulness, so that the mind will be at rest on these points. (22) Patients who greatly fear anesthesia are the ones likely to give the most trouble to the anesthetist. (23) Other things being equal, the intelligent and educated take anesthetics better than those of low intellect. (24) The patient should be kept as free as possible from unnecessary noise and other disturbance during the induction of anesthesia. (25) The pupillary reflexes constitute the best guide to the presence or absence of surgical anesthesia. (26) The anesthetist should watch carefully the pupils, pulse, respiration, and the color and condition of the skin, depending upon no single symptom as a danger-signal. (27) The patient should be carefully watched from the beginning of the anesthesia until fully restored to consciousness. (28) When anesthetics are properly administered, patients seldom struggle. (29) Noisy breathing during anesthesia should be the exception, as it generally means faulty administration. (30) The minimum amount of anesthetic should be given consistent with the production and maintenance of the desired degree of anesthesia. (31) Compression of the phrenic nerve will, if properly done, usually control retching and kindred symptoms occurring during anesthesia. (32) The use of drugs preceding and during anesthesia should be avoided save when positively indicated; and, if resorted to, they should be used with the greatest care. It is best to depend almost wholly upon other means for the prevention of syncope or to resuscitate. (33) Anesthetic mixtures are in general less safe than the 'straight goods.' One can not know the relative proportion of the different components that the patient actually inhales. (34) Partial or 'talking' anesthesia is advisable in some cases, but should be avoided in delicate or sensitive patients, especially for prolonged operations, unless taken quietly and with apparent abolishment of pain sense. (35) Finally, the subject of anesthesia and anesthetics should be thoroughly treated in medical colleges, and each student should be required to conduct a number of anesthetics under the supervision of an expert."

Bier¹ is an advocate of producing **anesthesia** in certain cases by **cocainizing the spinal cord**. He produced analgesia in 6 cases in the following manner: He first performed an ordinary lumbar puncture and injected a small amount of a 0.5% solution of cocain, being careful that no cerebrospinal fluid escaped. Even the smallest dose produced loss of sensation of two-thirds of the entire body. This loss of sensation begins in from 5 to 8 minutes in the lower extremities and ascends to the breast-bone. In larger doses the loss of sensation was noticed over the entire body except the head. The analgesia lasted 45 minutes. In his 6 cases he performed the following operations without the slightest pain: Resection of a tuberculous ankle-joint, removal of

¹ Wien. med. Bl., Aug. 17, 1899.

dead bone in a case of osteomyelitis of the tibia, resection of a knee-joint, removal of dead bone from the sacrum, and osteotomy. In 3 cases there were practically no after-effects. In the other 3 cases, and in 2 healthy physicians experimented upon, there were vomiting and headache, which were more positive and longer in duration than are seen after general anesthesia. These ill effects were not observed at once and did not occur for some hours, proving that they could not have been due to the poisonous effects of cocain and must have been produced by irritation of the central nervous system. If small doses are given, the sensation of pain is entirely lost and touch is slightly modified. A large dose will cause the cessation or diminution of the sense of touch. Appreciation of hot and cold remained, but the pain produced was very greatly lessened. Influenced by these unpleasant after-effects, Bier has abandoned the method, but thinks it may be of value in some exceptional cases in which general anesthesia is contraindicated and in which the Schleich method is not sufficient.

W. E. Lower¹ reports a case of **amputation of the middle third of the leg performed after injecting the spinal cord with cocain** after the method of Bier (see note, p. 53). In this patient there was arteriosclerosis, and it was considered unwise to give a general anesthetic. He inserted the needle between the last dorsal and the first lumbar vertebra and injected a hypodermic syringe of cocain solution. The strength of the solution of cocain was 0.2%. In 3 minutes there was complete analgesia of the foot and leg, and amputation was performed without pain. There was no shock and no circulatory depression. Lower said he did not think he had injected the cocain into the cord, as his operation was too low down. He thinks that he injected it into the subarachnoid space. He had experimentally injected it into the cords of dogs and they had recovered. Subsequent examination showed microscopic change in the cord, but it had not seemed to affect the animal unfavorably.

R. Matas² employed the **Bier method** in the operation for **hemorrhoids**. The needle was introduced between the fifth lumbar vertebra and the sacrum. Two doses of cocain were injected at intervals of 5 minutes, and 19 minutes after the first injection the operation was performed without pain. Matas states that he previously used this method, employing 1 cc. of a solution of eucaïn in two doses injected between the first and second lumbar vertebræ; but in his first case no anesthesia was produced, possibly because the amount of eucaïn was not sufficient.

T. Tuffier³ writes on **Bier's method** of anesthesia by the injection of cocain in the subarachnoid space of the cord. He refers to Bier's 6 reported cases and to the 4 cases of Seldowitsch. Tuffier himself had used the method in 5 cases. He used it experimentally in a man with sarcoma of the pelvis which was inoperable, who suffered from violent pain. The injection relieved the pain for 4 hours. He used it successfully in a woman with sarcoma of the thigh. Sensation returned

¹ Phila. Med. Jour., Mar. 31, 1900.

² Jour. Am. Med. Assoc., Dec. 30, 1899.

³ Presse méd., Nov. 15, 1899.

70 minutes after the injection. He used it in an operation upon the bones of the tarsus, in an operation upon the knee-joint, and he performed hysterectomy without the slightest pain. There were no unpleasant after-effects, excepting some headache, and in one case vomiting. It is proved that injection of cocain into the subarachnoid space completely anesthetizes the lower extremities. When carefully given, the injections do not seem to be dangerous, but should be used only when general anesthesia is contraindicated. [Since the publication of the foregoing paper Tuffier has employed Bier's method in over 160 cases and without ill result.]

Seldowitsch¹ has made a study of the anesthesia produced by **cocainizing the spinal cord**. He has experimented upon animals and operated upon man, and the observed phenomena agree. He believes that the elevation of temperature, the headache, the vertigo, the pallor, the dry mouth, and the vomiting which follow this method are really toxic symptoms due to the absorption of the cocain, because injections of like amounts of salt solution in the same region produced no effect. These symptoms can not be due to the escape of cerebrospinal fluid, since they occur when no fluid escapes. It is hoped that future investigations will teach us how to use this method without injurious after-results. [The real value of the method is uncertain. Bier does not agree with Seldowitsch that after-effects are due to absorption of cocain, and points out that they do not arise quickly after the injection, as they should do were they toxic phenomena.² The experiments of the Russian observer are very important, and his view that absorption of cocain produces the unpleasant after-effects seems to receive confirmation from the fact that the injection of normal salt solution into the subarachnoid space is not followed by giddiness, vomiting, or headache. The method is called Bier's, but should be called the Corning-Bier method, as it really springs from the observation of J. Leonard Corning, of N. Y., who in 1885³ produced analgesia of the limbs by injecting cocain between the spines of the eleventh and twelfth dorsal vertebrae. Corning's theory was that if cocain is injected between the vertebrae, it will be taken up by small veins and carried to the spinal cord. Bier suggested the injection into the subarachnoid space.⁴]

William H. Leszynsky⁵ discusses the subject of **paralyses following general anesthesia**. He objects to the terms "anesthesia paralysis" and "postanesthetic paralysis" because they lead to the erroneous conclusion that the condition is produced by the special action of the anesthetic agent. Postanesthetic paralysis in rare instances is due to the rupture of a cerebral blood-vessel, but in the vast majority of cases the condition is a peripheral palsy due to direct or to indirect pressure upon a nerve or nerves. Of course, we do not include cases in which nerves were cut or injured in an operation. It is known to all neurologists that the irritability of peripheral nerves is often increased so that

¹ Centralbl. f. Chir., No. 41, 1899.

² Deut. Zeit. f. Chir., vol. LI, 1899.

³ N. Y. Med. Jour., Oct. 31, 1885; Med. Rec., Mar. 17, 1888.

⁴ Editorial in Med. Rec., Aug. 5, 1899.

⁵ Med. Rec., Oct. 21, 1899.

a very slight degree of pressure produces a numbness in the nerve area, and, if pressure is continued, causes paralysis. Alcohol strongly predisposes to such a condition. The paralysis produced by pressure during anesthesia can be prevented in every instance. It usually affects the upper extremities and is brought about by one of the following positions or manœuvres: Continued elevation and extension of the arm, causing the head of the humerus to make pressure on the brachial plexus; the application of clamps or tight straps upon the lower extremities or around the shoulders; extending the head to one side, causing stretching of nerve-trunks and making them very susceptible to pressure; keeping the arm under the head; allowing the arm or leg to hang over the edge of the table; pressure by the elbows of the anesthetizer upon the brachial plexus in the clavicular region. Many of these patients get well in a few days or weeks, but in many others the paralysis lasts for months or years, and in some it is incurable. Medico-legal questions may arise as to the liability of the surgeon in such cases if it can be proved that proper diligence was not exercised in guarding the patient from injury.

Dewar¹ advocates the use of a saturated solution of **chloretone** in certain cases as an antiseptic and local anesthetic. A wound can be bathed with the saturated solution and the pain of suturing will be very greatly diminished. The solution can be safely injected into the urethra. This drug is a hypnotic, an antiseptic, and a local anesthetic.

George B. Hamilton² writes on **Eucaïn** β as a local anesthetic. He says that with cocain one has always some fear of cardiac or other bad symptoms. With eucaïn α the results were not always satisfactory, as there was considerable burning pain after the passing away of the anesthesia. Eucaïn β is extremely satisfactory. A 2% solution should be used in preference to stronger solutions. If the 2% solution is injected in the line of the cutaneous nerves which supply a part, a considerable area becomes analgesic on the peripheral side of the puncture. If an operation is to be conducted on the skin of the middle of the thigh, the hypodermic needle can be introduced in the line of the middle internal and external cutaneous nerves and 2 inches nearer Poupart's ligament. If an operation is to be performed on a finger, the anesthetic should be inserted in the neighborhood of the digital nerves, as near as possible to the web and on the palmar surface. If the seat of operation is over the middle of the deltoid region, the injection should be made near where the circumflex nerve winds around the outer side. The skin should be held tightly between the finger and the thumb on the proximal side of the point at which the injection is to be made, a long hypodermic needle should be carried into the subcutaneous tissues, and from 5 to 7 minims of the solution should be injected in two directions from one puncture. Three or four punctures are usually made; but if the patient suffers pain when the operation is carried out, another puncture should be made, or some eucaïn solution should be poured over the wound.

¹ Therap. Gaz., Feb. 15, 1900.

² Lancet, Aug. 26, 1899.

Anesthesia is produced almost at once, not in 10 minutes, as has been stated, and suppuration does not follow if aseptic precautions were employed. The anesthesia in most cases lasts at least a half-hour.

Arthur E. Barker¹ furnishes a note on some further experience of operations under **local analgesia produced by eucain β** . He says that no ill effect has followed the use of the normal saline solution with 1:1000 of eucain β added to it, and this is the solution that he habitually employs. No toxic troubles have arisen even when 5 or 6 ounces of the solution were used, and the primary union of wounds has not been interfered with. In several cases there have been free sweating and pallor, but these may have been due to some other cause; and when we consider the fact that very few of the patients vomited during the operation, it seems probable that they were. In long operations Barker has used as much as 6 ounces of the solution without ill effects. There are certain limitations to its use. Children appear to be unsuitable subjects because the sight of surgical preparations frightens them, and their emotional condition is entirely upset by even the slightest pain. For the same reason very timid adults do better under general anesthesia. If the part is inflamed, it is difficult or impossible completely to prevent the pain, although in one case of typhlitis and general peritonitis there was no evidence of pain during the operation. This procedure only causes local analgesia, and it is impossible to render insensible all structures which may be affected by the manipulation of the operation; hence, when resecting an intestine, avoid dragging upon the mesentery, as the mesentery is beyond the reach of the injection. Otherwise, the patients feel as though the abdomen were being pressed upon, or as though there were griping. In a case of posterior gastro-enterostomy which was borne extremely well the lifting-out of the stomach produced this feeling and also vomiting; but when the stomach was allowed to pass back again, the sensation immediately disappeared. In operating for inguinal hernia dragging upon the cord produces great discomfort, but if the injection is made high up and the cord is dissected from the sac without dragging, no pain is complained of. This also applies to the omentum and sac. There is another drawback to the method, which is, however, trifling: when the fluid is first injected, it distends the areolar spaces and produces an artificial edema, which makes the first dissection somewhat obscure; but this condition lasts but a short time, as the fluid quickly runs out of the wound. If the dissection is carried out rapidly by cutting with a knife or with scissors, the division of a small vessel causes a twinge of pain; but if the cuts are made deliberately with knife or scissors, no pain is felt, as a rule. These facts, of course, diminish the speed with which an operation can be performed, but it is a great advantage to escape the sickness which follows an anesthetic, and to know that the patient will be able to enjoy food at once. The cases most suited for this method are those in which there is danger of complications following the use of chloroform or ether, particularly a case of intestinal

¹ *Lancet*, Jan. 20, 1900.

obstruction in a weak or an old person. The method undoubtedly requires considerable practice so that the surgeon may obtain really good results. The solution should be warm when used, and the tissues will be ready for operation 5 minutes after injection; after 20 minutes a fresh injection will be necessary. All dragging or tearing must be avoided and deliberate dissection must be practised. The operating table must be made comfortable for the patient, and it is desirable to place a screen between the patient and the operator. In the case of an excitable patient a preliminary hypodermic injection of morphin is of value. Barker cites a number of important cases which he has operated upon by this method. Among these we may cite 15 cases of radical cure of hernia; 1 herniotomy for strangulation; 1 intestinal resection for gangrene; 1 gastro-enterostomy; 2 abdominal sections for epityphlitis; 1 perforated gastric ulcer; 1 exploratory section for carcinoma of the gall-bladder; 4 goiters; 4 empyemas; 5 cases of varices of the leg; 4 cases of colotomy; 2 rectal cases; 2 cases of wiring the patella. He mentions 53 cases in all, and in 9 of these he thought it best, because of pain or nervousness, to give general anesthesia in the middle of the operation. He has concluded that rectal cases are not suitable for the operation, as the dragging of the bowel affects parts that have not been reached by the solution. He does not believe that the method is suitable for perforated gastric ulcer for the same reason, and for the other reasons that the peritoneum is inflamed and the operation is a long one.

Cushing¹ writes on **local anesthesia in herniotomy**. He states that the operation may be performed practically without pain. He publishes 32 cases of herniotomy performed in this manner—cases which were unsuited to the use of the general anesthesia because of old age or great exhaustion. This method avoids the common unpleasant consequences which follow general anesthesia. There is little liability of disturbance of the kidneys. It is not necessary to alter the patient's diet, and the dressings can be put on after the operation, with a view to the patient's comfort. The great advantage is that the surgeon is able to perform an operation with practical safety in a class of patients who would be very liable to die if given a general anesthetic. Operation under a local anesthetic of course takes longer than under a general anesthetic; the restrictions on the surgeon cause the operation to be more difficult, and some pain is inflicted. The degree of pain depends to a considerable extent on the surgeon's perfect acquaintance with the necessary steps of the operation and upon his knowledge of the situation of the sensory nerves of the region. Even if pain does occur, the slight pain is preferable to the discomfort which follows the administration of ether.

Charles A. Elsberg² advocates the use of **nirvanin** instead of cocaine or eucain as the anesthetic agent in **infiltration anesthesia**. He says that cocaine is 10 times as toxic as nirvanin, and that a 1% or 2% solution of the latter can be kept indefinitely and will remain sterile.

¹ Ann. of Surg., Jan., 1900.

² N. Y. Med. Jour., Jan. 13, 1900.

It is advisable to keep a 1% solution and a 10% solution in stock and to dilute one of these with a 0.4% saline solution before using. In general, a 1:500 solution should be employed, and we can use 5 times as much of this as we can of Schleich's fluid. The technic of the infiltration does not differ from that of the Schleich method. Nirvanin has no irritating effects on the tissues and it does not interfere with primary union. It is a very valuable anesthetic, and is 3 times less poisonous even than eucain. It is distinctly antiseptic and it may be diluted a number of times without diminishing its anesthetic powers.

Oscar Bloch¹ is a believer in local anesthesia by the use of **ethyl chlorid**. In extensive operations he applies ethyl chlorid locally, combined with the administration of chloroform. He says that if the skin can be certainly and without harm anesthetized, extensive operations can be performed without any pain worth mentioning. The difficulty is that there is a strong psychic impression. Anesthesia can be induced by very little chloroform, and then the commencement of the operation causes neither physical nor psychic pain. Later on, if the patient regains his senses and begins to appreciate that he is being touched or thinks he feels pain, he can then be reanesthetized with a very small amount of chloroform. Of course, if he becomes greatly excited, complete anesthesia must be produced. Ethyl chlorid is applied in a linear manner to the skin, and the moment the skin whitens and becomes hard to the touch it should be incised. If the skin is healthy, it may be cut without pain, but incision of the healthy subcutaneous tissue will probably be painful through section of small nerve branches. If the skin is inflamed, ethyl chlorid will make it white and hard, but does not seem completely to anesthetize it, although the pain which results in the operation often is really owing to the pressure of the instrument on the deeper inflamed structures. Bloch says that in an operation such as herniotomy, tracheotomy, or colotomy the skin is healthy, and can be painlessly incised under ethyl chlorid, and the patient will feel pain only if the parts are pulled upon or pressed upon. These operations can be performed painlessly without general anesthesia. In the method by the local application of ethyl chlorid with previous chloroform anesthesia the procedure is carried out as follows: An Esmarch inhaler is placed over the nose and mouth and the patient is told to breathe quietly as if he were endeavoring to go to sleep. The operator tells him not to feel any fear, and if he experiences pain to say so, but not to mind being touched. Some chloroform is poured on the mask and the spot wet with chloroform is covered over with the assistant's hand to keep the vapor from escaping with too great speed. In a short time a little more chloroform is added, and then Bloch inquires if the patient is asleep. It will be seen that the patient who is inhaling from 1 cc. to 2 cc. of chloroform is asleep or feels like going to sleep. At this moment ethyl chlorid is applied to the skin. The anesthetist keeps on adding, from

¹ *Birmingham. M. Rev.*, Mar., 1900; from *Rev. de chir.*, Jan., 1900.
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time to time, a few drops of chloroform. When the skin becomes white and hard, it is incised. If after cutting the skin the patient feels pain in the subcutaneous tissues, a piece of sterile gauze is placed over the wound and a little more chloroform is given, and in a moment or so the operation can be continued. The fascia and the muscles must be divided with a sharp scalpel, and blunt dissection must not be made, as it causes pain. The incision of healthy peritoneum causes no pain if it is not pulled on. The operation is carried on by a succession of light anesthetic conditions, although in some cases it may be necessary thoroughly to anesthetize the patient with a general anesthetic.

ESOPHAGUS AND STOMACH.

George Heaton¹ writes on the detection and removal of **foreign bodies impacted in the esophagus**. He says that inversion should never be employed. It is of some use when foreign bodies are lodged in the air-passages, but it is of no use when a foreign body is grasped by a muscular tube like the esophagus. The use of emetics has been abandoned, though it has occasionally proved successful. Their use is dangerous, because they may lead to the infliction of severe injury on the wall of the esophagus and are very exhausting to a patient who is already depressed. The only case in which emetics may reasonably be employed is when a soft substance, such as a piece of meat, is lodged. The best method of dealing with lodged foreign bodies is extraction, if possible, through the mouth. The three most useful instruments are the coin-catcher, the horsehair probang, and the esophageal forceps. The patient should be deeply anesthetized, his head should be thrown back over the end of the table, and a pair of properly curved forceps should be passed into the esophagus. Even when the body is felt it is not always easy to extract it. If the body is smooth, the forceps are liable to slip; if it is irregular, extraction may demand injurious force. When attempts at extraction fail, we have one or two methods remaining: we may endeavor to push it into the stomach, in the hope that after reaching that organ it will pass; or we may cut down upon the foreign body and remove it. Pushing downward must be carried out only with extreme gentleness. It should be employed only when the body is known to be of soft consistence or when it is lodged so well down that it can not be reached by other means. A last resort is **esophagotomy**: that is, the extraction of the body through an incision in the neck. The incision is made along the anterior margin of the sternomastoid muscle, and should be long. The esophagus is thoroughly exposed and the hemorrhage is completely arrested. An esophageal bougie is inserted from the mouth, and the top of this solid instrument is cut down upon. If the opening is made well to the outer side of the esophagus, there is

¹ *Birmingham M. Rev.*, May, 1900.

no risk of injury to the recurrent laryngeal nerve. If the foreign body can be felt through the wall of the esophagus, it is not necessary to insert the bougie first, but the incision can be made directly upon the foreign body. When the excision is made directly upon the foreign body, the impacting substance can usually be readily removed; but if the impaction has taken place low in the neck or in the upper part of the thoracic portion of the esophagus, forceps will have to be introduced through the incision in order to grasp the body. After the removal of the foreign body it is a point in debate whether the surgeon should or should not attempt to obtain primary union of the wound. Heaton proposes the following plan: If the incision in the esophagus is clean-cut, if the foreign body has been lodged but a short time, if there has been but little trouble in extraction, the wound of the esophagus should be completely closed with 2 layers of sutures, the mucous membrane being sutured with catgut and the other structures with silk. The external wound should then be partly closed, a drain being put in place down to the esophagus. For the first 3 or 4 days after operation the patient is fed through an esophageal tube passed through the mouth, or through the nose if the patient be a child. If any leakage takes place through the sutured esophagus, it finds its way outward. In a case in which the esophagus has been damaged, either during the lodgment of the foreign body or by the surgeon's efforts to remove it, no attempt should be made to close the wound. An esophageal tube should be passed through the wound into the stomach and the external wound should be left open and packed around the tube with tampons of gauze. It is only in this way that we can hope to avoid the most fatal consequence of operations on the esophagus: that is, diffuse cellulitis of the posterior mediastinum. At the end of a few days the tube may be withdrawn from the wound in the neck and 3 or 4 times a day can be passed into the stomach to permit of feeding. In a case in which the body is lodged in the thoracic portion of the esophagus, when attempts at extirpation through the mouth have proved unsuccessful, one of three courses is open to the surgeon: he may open the esophagus low in the neck and try to remove the body through this opening by the use of suitable forceps. Another method is to open the stomach, dilate the cardiac orifice, and attempt to draw the foreign body down. This method has not, to Heaton's knowledge, yet been attempted. If the body is in the thoracic portion of the esophagus, but not near enough to the stomach to justify this second method, the only other one is to attempt to expose the esophagus posteriorly, accomplishing this by removing pieces of several ribs and bits of the transverse portions of their corresponding vertebræ, an operation which he thinks may, in the near future, be successfully carried out.

Maurice H. Richardson¹ reports the case of a man who **swallowed his suspenders**. The man was a shoemaker, 29 years of age. He

¹ Boston M. and S. Jour., Feb. 15, 1900.

had been discharged a few days before from an insane asylum. He said that two weeks before his entrance into the Massachusetts General Hospital he had attempted to swallow his suspenders. He succeeded in getting down a portion of the suspenders and some broken glass, but just how much, was uncertain. The olive-tipped probang detected an obstruction in the esophagus on a level with the transverse portion of the aortic arch. An x-ray picture showed unmistakably a suspender buckle at the level of the arch, and possibly another higher up. A matter of importance was to decide upon the safest route of removal—by the mouth, by external esophagotomy, or by gastrotomy. Richardson decided that any manipulations in this case must be dangerous, because the impaction had taken place long before, and if erosion were present, it must be advanced, and it would be by no means surprising if attempts at extraction by any route would end in a deluge of blood from the aorta. The work from within the mouth would of necessity be uncertain and haphazard. Richardson decided to take no chances by the use of instruments through the mouth. Gastrotomy was not to be considered because the foreign bodies were high up. He therefore performed external esophagotomy. By means of forceps he removed a ball and string attached to a brass ring, half a suspender web with two buckles, and then a third buckle—all covered with foul-smelling, dark serum. He then passed successfully into the stomach, without meeting further obstruction, the olive-tipped probang, the coin-catcher, and the bristle probang. The finger detected an ulcerated area just above the level of the aortic arch. The wound in the esophagus was sutured in 2 layers with fine interrupted silk sutures and the external wound was closed except for a gauze strand leading from the esophageal sutures. The wisdom of the use of the gauze wick was proved, for at the end of 24 hours there was wound infection and a high temperature. The irrigation of the wound was followed by the quick subsidence of the infection, and the wound rapidly healed. This patient was cured.

George Ben Johnston¹ reports a case of **traumatic stricture of the esophagus** for which he performed gastrostomy. The great benefit of this operation is shown in the rapid gain in weight, for this patient gained 45 pounds in 86 days after the operation.

J. E. Summers² writes on **stricture of the esophagus as a complication and sequel of typhoid fever**. He refers to Osler's case and to Packard's case, and then reports a case of his own which was cured by Abbe's operation. [Abbe's operation is described on page 62.]

Martin B. Tinker³ reports a case of **stricture of the esophagus following typhoid fever** which was under the charge of Professor Keen. Before consulting Dr. Keen gastrostomy had been performed for the purpose of dilating the stricture, but no precaution had been taken to prevent the reconstruction of the stricture. Unfortunately the patient did not return for further treatment.

¹ Phila. Med. Jour., Jan. 27, 1900.

² Phila. Med. Jour., Oct. 28, 1899.

³ Phila. Med. Jour., Mar. 3, 1900.

W. J. Mayo¹ elaborately discusses **cicatricial stricture of the esophagus** and its treatment. He considers the etiology and character, the diagnosis, prognosis, and treatment, and emphasizes his views by the citation of illustrative cases. He says that it is of the utmost importance to treat a traumatism of the esophagus early, before contraction takes place; and if this is done, many unfortunate results which so uniformly follow can be avoided. After an individual has swallowed some caustic substance, systematic sounding should be commenced in from 2 to 4 weeks. A foreign body should not be allowed to remain impacted until ulceration occurs, and it is not good surgery to make prolonged efforts to remove a foreign body from the esophagus through the mouth. Gerster has pointed out how easy it is to remove a foreign body by external esophagotomy if the operation is performed early, before ulceration occurs. The x-rays are of great value in locating these bodies, and an incision may be made in the right side of the neck instead of in the left as is ordinarily done, if such a selection is indicated; for instance, in a case of Mayo's in which an overshoe buckle was impacted; the loop of the buckle lay to the right and the sharp prongs to the left. In the lower esophagus the method of removal through a gastric incision is of the greatest value. For feeding purposes in the primary stages of acute ulceration of the esophagus Tillmans advocates preliminary gastrostomy. In tuberculous and syphilitic ulceration proper constitutional treatment should be employed and sounds should be used during the period of cicatrization. If a stricture is dilatable, gradual dilation is the method of choice. The larger and softer the dilator, the better; but, unfortunately, in advanced cases such an instrument is useless. In an advanced case the surgeon may employ a whalebone or an olive-tipped probang for the smaller varieties, and a whalebone stem to which increasing sizes of metal or ivory tips can be attached for the larger varieties. The tips should be long and tapering. Such a tip will engage in the stenosed portion more quickly than the ordinary olive tip. Many cases seem to be impermeable to the probe which in time can be safely passed. In the vast majority of cases a bougie can be inserted if care and gentleness are employed. Whalebone bougies greased with glycerin should be passed into the gullet and held against the stricture in the same manner that filiforms are used in the urethra, and one will usually slip through. When one slips through, it is best to stop further manipulation for the time, repeating the process every other day and using, it may be, several increasing sizes at one sitting. In a few cases it is necessary to use an anesthetic the first time or two, but usually it is unnecessary. Mayo then discusses the question of nondilatable strictures. For such a stricture in the vicinity of the cricoid cartilage external esophagotomy is the operation of choice. Just as in perineal section, funnel-shaped retraction of the cut portion occurs because of adhesion to the external tissue, and thus future contraction is lessened. Kendall Franks has successfully performed esophagotomy,

¹ Jour. Am. Med. Assoc., July 29, 1899.

the divided ends of the tube being sutured over an instrument passed through the nose. For a dense stricture above the arch of the aorta and below a point which can be directly divided, Gussenbauer believes esophagotomy is the best operation. An external incision is made in the neck, the esophagus is opened, the tenotome is introduced, and the stricture is divided. Unfortunately, the majority of the dense strictures are in the lower esophagus; or if there is a stricture in the upper portion, there is usually another stricture lower down. How to reach a stricture of the esophagus below the arch of the aorta by direct means is still a problem. It has been suggested that the esophagus may be reached posteriorly, and Rehn has performed such an operation, making an incision from the fourth to the eighth rib on the right side of the spinal column, but the difficulties and dangers of this plan are so great that indirect measures are to be relied on in preference. For this purpose two methods are available: Abbe's well-known string-saw method and Ochsner's operation. In Ochsner's operation a loop of rubber tubing is used as a dilating medium. The one method supplements the other. **Abbe's method** is performed as follows: Through a gastrotomy wound a stout piece of silk is carried in a retrograde way through the esophagus and out through the mouth or an external esophagotomy wound. The stricture is made tense by engaging bougies in it from below. When the string is used as a saw, the tight bands are divided while the soft parts are pushed out of the way uninjured. After further dilation has been secured the incisions may be closed or a rubber tube may be inserted to a point above the stricture and brought out of the gastric incision, the latter being sutured to the margins of the abdominal wound. In 2 or 3 days the tube is removed and sounding from above is employed in the usual manner.

Ochsner's operation (Fig. 10) is performed as follows: "The anterior wall of the stomach is drawn out of a left oblique incision through the abdominal coverings; a small opening is made into the stomach sufficient in size to introduce the finger. A whalebone probe, to the tip of which a silk string guide has been tied, is now passed through the esophagus either from above or retrograde, as in the Abbe method. With this guide a loop of silk is drawn out of the gastric incision in such manner as to leave the guide as a third string. Into this loop a small soft rubber drainage-tube, 3 feet or more in length, is caught in the middle; by traction on the ends of the doubled thread through the mouth this loop of rubber tube is drawn through the stomach and made to engage in the stricture. The greater the amount of traction, the smaller the stretched rubber tube, until it is sufficiently reduced in size to enter the stenosed portion; by alternating the direction of the pull the tube is drawn out by its free ends and in by the silk loop. Increasing sizes of tubes can be employed, and if necessary the third string can be used as a string-saw after the Abbe plan of procedure." This operation was first successfully performed by A. J. Ochsner, of Chicago, in February, 1899.

Internal esophagotomy has a death-rate of 25%. It is unneces-

sary above the arch of the aorta, and below this region it is a chance shot, and if success is obtained it is only a lucky accident. Koenig maintains that permanent gastrostomy is preferable. Some surgeons use Symonds' tube as originally advocated for malignant stricture, believing that steady pressure will gradually increase the caliber; but a stricture sufficiently large to permit of permanent tubage can be overcome by gradual dilation. In some cases impassable through the mouth, after an external esophagotomy the opening can be found and a bougie may be carried through the narrow channel, future dilation being conducted through the mouth. This plan has been particularly advocated

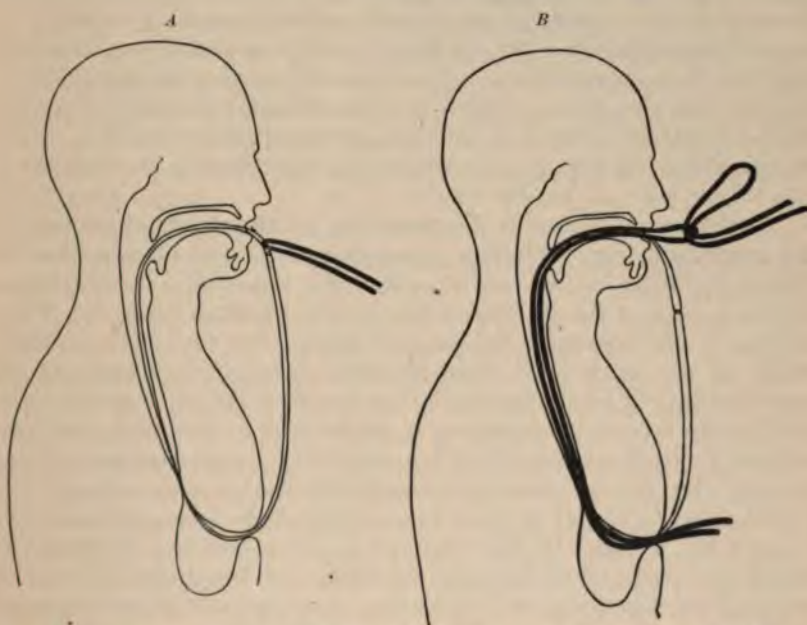


Fig. 10.—Ochsner's operation for stricture of esophagus: *A*, Manner of introducing the silk cord with the rubber drainage-tube looped in position ready for introduction; *B* shows a double rubber drainage-tube, looped into one already drawn through. As many tubes as may be necessary to obtain the desired dilation may be drawn through in this way (W. J. Mayo, in Jour. Am. Med. Assoc., July 29, 1899).

for strictures in children. Gastrotomy and retrograde dilation have often been carried out successfully. Not unusually there is great difficulty in attempting retrograde dilation through a gastric fistula, and, strange to say, it may be next to impossible to find the cardiac opening; hence, dilation should be carried out as a primary operation if possible. Richardson directs that a small transverse incision be made in the stomach in the lesser curvature and in the neighborhood of the pylorus. If traction is made on the stomach just below this incision, the lesser curvature forms a sulcus which will lead the instrument into the cardiac orifice. Abbe introduces a string-saw, and by this means dilating bougies can be drawn upward in a retrograde manner; he retains this guide in

place until a sound can be introduced from above. We know that it is often possible to pass an instrument in a retrograde manner when a stricture is impassable from above, but regular dilation from below without a guide may be extremely difficult. If the condition of the patient will not permit of prolonged attempts at retrograde dilation, rapid gastrostomy should be performed. In cases in which a large part of the esophagus is obliterated permanent gastrostomy is necessary. Mayo sums up his conclusions as follows: "(1) Systematic sounding should be commenced in from 2 to 4 weeks after the swallowing of a caustic substance; (2) should the traumatism be severe, immediate gastrostomy will lessen inflection and hasten cicatrization, sounding being carried on as before; (3) nondilatable strictures in the vicinity of the cricoid cartilage should be divided by external esophagotomy; (4) stricture above the arch of the aorta may be safely cut by a combined internal and external esophagotomy; (5) dense thoracic strictures are best dilated by Ochsner's method, and, if necessary, divided by Abbe's string-saw; (6) impassable strictures should be treated by retrograde dilation; (7) a dilated stricture should be occasionally sounded for years, if not for life."

De Quervain¹ writes on the **resection of the cervical portion of the esophagus for carcinoma**, presenting a study of 14 cases from literature, including the case of his own. His conclusions are as follows: Certain cancers of the esophagus may be extirpated in the neck. Cases suitable for this operation are those which involve the esophagus alone, which do not reach lower than the upper level of the aorta, and the upper margin of which growth is not less than 20 cm. from the teeth. It is rarely necessary to perform a preliminary tracheotomy, and preliminary gastrostomy is preferable to preliminary esophagotomy. A preliminary gastrostomy greatly favors rapid healing of the esophagus. If possible, the upper end of the lower portion of the esophagus should be fixed in the wound. If this can not be done, however, it should be ligated and permitted to fall into the thorax. The patient is better off with a gastric fistula than he is with the contracting scar of the esophagus requiring constant dilation. When it is impossible to unite esophageal ends, there will be a salivary fistula from the upper end.

Poirier² writes on **gastrectomy for cancer of the stomach**. He maintains that just as we remove infected glands in cancer of the breast, so we should remove infected glands in cancer of the stomach. He believes in the view of Cunéo that cancer of the stomach leads to early infection of adjacent glands. Poirier reports a case on which he operated. The growth affected the pylorus and adjacent portion of the stomach. He removed the tumor and some of the lesser and greater omenta, and the microscopic examination showed that each portion of omentum contained deposits of cylindric epithelioma. The disease usually spreads in the direction of the lesser omentum. The primary area of disease, along with the affected omentum, should be removed in one piece, so that diseased lymph-vessels are not allowed to remain.

¹ Arch. f. klin. Chir., 1899, Bd. LVIII, Hefte 1-4.

² Bull. et Mém. de la Soc. de Chir. de Paris, Jan. 2, 1900.

Guinard¹ points out certain **contraindications for radical removal of cancer of the stomach**. They are: Great exhaustion of the patient; the existence of metastases in the viscera or extensive involvement of the lymphatic system; and immobility of the tumor because the esophagus and duodenum are involved. Before the operation is performed, any proceeding which weakens the patient should be avoided. Among the procedures which do weaken him are purgation and the employment of lavage. During the operation chloroform must be carefully given, and every attempt should be made to avoid hemorrhage. Sutures should be placed only in absolutely healthy tissue and there should be no marked tension on the suture line. Continuous sutures should be used. Every effort should be made to operate rapidly. After the operation the patient should be fed on the second day, or even on the first day. If vomiting occurs after the operation, the stomach should be washed out while the patient is lying down. The mortality of such operations is about 10%. In a case in which it is doubtful whether or not an operation is proper an exploratory celiotomy should be performed to determine the matter.

Charles B. Bingham² makes a report upon the patient from whom 20 months ago he **removed the entire stomach** for cancer. She eats what she pleases, digests her food, goes about in the street and among her family, and weighs 112 pounds. She is not restricted at all in her food. Richardson³ makes some remarks on his case of **total extirpation of the stomach**. The patient is now dead, and he presents the autopsy findings. He found a mass of recurrent cancer infiltrating the peritoneum and the walls of the small intestine. The mesentery of both the large and the small intestine contained cancerous masses, and the lumen of the colon was obscured by the splenic closure. At the site of junction of the esophagus and duodenum the opening was large enough to permit the passage of food. There was no evidence of recurrence at this point. He states that such radical operations as total gastrectomy must of necessity be performed but rarely, as we do not often meet with a case exactly suited for it. The only method of discovering favorable cases for operation is to perform early exploratory operations upon doubtful cases. H. Beeckman Delatour⁴ reports a case in which he successfully removed almost the entire stomach. The patient was well more than a year after operation. Charles A. Morton⁵ reports a case in which he successfully removed three-fourths of the stomach for malignant disease. Kocher⁶ has recently performed **total gastrectomy** on a patient with cancer of the pylorus in which there was no lymphatic involvement. The patient did well for 4 days, when she died, and necropsy disclosed the fact that the cause of death was an area of necrosis in the transverse colon. The anastomosis of the esophagus and duodenum was found healed. The area of necrosis was due to pressure causing

¹ Rev. de Thérap. Méd.-Chir., Aug. 1, 1899.

² Boston M. and S. Jour., Oct., 1900.

³ Boston M. and S. Jour., Sept. 28, 1899.

⁶ Brit. Med. Jour., Oct. 21, 1899.

⁴ Med. Rec., Feb. 3, 1900.

⁵ Phila. Med. Jour., July 1, 1899.

interference with the circulation of the intestine brought about by the operation. Such harmful pressure is most apt to be exerted when a small incision is made. [This is a significant fact and should be set in opposition to the teaching that a small incision should be made for almost any and for nearly all conditions]. John Bruce Harvie¹ reports a case of recovery after total gastrectomy for carcinoma. He says in conclusion: "The successful cases of Dr. Carl Schlatter, of Zurich, Dr. Charles Brooks Brigham, of San Francisco, and Dr. Maurice Howe Richardson, of Boston, have shown the possibility of removing the stomach in its entirety, without apparently causing any interference with nutrition. Stimulated by the knowledge furnished by these surgeons, I am able to report another successful case of gastrectomy. Notwithstanding the fact that this operation is one surrounded with the heaviest responsibilities, and may at times assume difficulties in its execution which will tax the ingenuity of the most experienced, it would seem that in all cancerous states, when the conditions are at all favorable, radical procedures should be recommended. When a diagnosis can be made that such a process is at work, the surgeon can look forward to only one termination, and therefore should shoulder the responsibility of doing work (which up to the present writing is surrounded with a higher mortality than perhaps any other operation) that may result in a permanent cure, or, if not, may bring about an amelioration of the difficulty and prolong life. When the operation for the extirpation of a malignant growth in any other part of the body is undertaken, we do not regard it in high favor unless it can be attended to early. The moment it ceases to be a local issue and regional involvement occurs, brilliant results and lasting benefit will be the exception. Most of our stomach cases have been operated when the patients have been exhausted and worn out by the inroads of the disease. If these cases could be secured when the new growth is in its infancy, I venture to say that the showing would be vastly changed."

J. E. Allabin² writes upon **destructive growths of the pylorus**. He states that in one-fifth of all primary cases of cancer the stomach is the seat of the disease, and that in gastric ulcer the pyloric region is the seat of trouble in 60 % of the cases. Permanent cure of a gastric ulcer is limited to surgical methods. For cancer of the pylorus, pylorectomy is the proper operation. An early diagnosis is the most essential point for operative treatment. If pylorectomy is performed early, the results will be as favorable immediately as in any other abdominal operation, and the ultimate results will be as good as those which follow operation for cancer of the breast. [Kocher has pointed out that the prognosis of gastric cancer is much more favorable than formerly, and claims that the statistics of Ewald and Von Hacker show a mortality higher than is warranted by recent experience. He says that insistence upon early operation will lower the mortality still more. Early diagnosis is often difficult and sometimes impossible without exploratory incision. A sign

¹ Ann. of Surg., Mar., 1900.

² Jour. Am. Med. Assoc., Nov. 28, 1899.

relied upon by Kocher is persistent epigastric resistance when the patient is anesthetized. Kocher has performed pylorotomy 57 times, and 8 of the cases were cured. There were 5 deaths due to the operation.]

Abel¹ reports a case of **congenital hypertrophy of the pylorus** which he treated successfully by gastro-enterostomy when the patient was 8 weeks old. The performance of the gastro-enterostomy required 14 minutes; the whole operation required 40 minutes. The child was given some milk 1 hour after the operation. The patient made a recovery which was apparently complete, but the future of the case is of course uncertain.

Lambotte² discusses the operative methods of treatment for **simple pyloric stenosis**. He disapproves of Loretto's method of divulsion, considering it not only uncertain, but dangerous. He says that pyloroplasty may lead to perforation and death, or may be followed by reconstruction of the stenosis. The operation of resecting a cuneiform portion of the anterior wall of the pylorus, an operation devised by Czerny, has some of the same objections as can be urged against pyloroplasty. The author believes that the best method is to excise the stenotic ring and then employ a circular suture to unite the stomach and duodenum. This establishes a free communication and removes the danger of reproduction of the stenosis. It is a better operation than gastro-enterostomy because it removes the disease, does not alter the shape of the stomach, and is not likely to be followed by adhesions which would interfere with peristalsis. After this operation the stomach will return to its proper size. Of course, the existence of perigastric adhesions would contraindicate the performance of this operation. The author has operated 7 times with perfect satisfaction.

Neurath³ writes on **congenital stenosis of the pylorus**. He says that the prognosis is reasonably good. He speaks of the various medicinal plans of treatment and then takes up the surgical methods. He says that Schwyzer was the first to advise operation, and he thought that we should do either Loretto's operation or gastro-enterostomy. He quotes Stern as advising operation in all cases of stenosis of the pylorus in which there are symptoms of absolute bowel obstruction; but some surgeons oppose surgical treatment strongly, using anodynes, hot applications, washing of the stomach, etc. He attaches considerable importance to the view that hyperacidity may cause spasm of the pylorus. In spasmodic cases operative treatment, of course, is not to be thought of.

Koeppelin⁴ reports a case in which he has modified the operation of **pyloroplasty**, making it a **submucous procedure**. He makes a horizontal incision through the serous and muscular coats of the bowel and through the scar tissue if there be any. Through this wound the mucous membrane bulges. The divided two coats are then sewed up vertically as in ordinary pyloroplasty. This is the third case of submucous pylor-

¹ Münch. med. Woch., Nov., 1899.

² Ann. de la Soc. Belge de Chir., No. 4, 1899.

³ Centralbl. f. Schweiz. Aerzte, Oct. 1, 1899.

⁴ Lyon méd., Sept. 24, 1899.

oplasty he has performed, and all three have been successful. The author considers it safer than the ordinary procedure.

Rutkowski¹ discusses the operation of **gastro-enterostomy**, and he believes in combining with gastro-enterostomy a temporary gastrostomy. He performs the gastro-enterostomy first, and then above this makes a small incision into the stomach, through which he inserts a drainage-tube. The other end of the drainage-tube emerges from the abdominal wound. He follows either Witzel's or Kader's method of gastrostomy. The tube passes from the stomach through the gastro-enterostomy opening well down into the jejunum. The advantage of this operation is that the patient can be fed at once without the danger which attends mouth feeding, while the gastric juice which gathers in the stomach is able to pass alongside the tube into the bowel. Ten days after the operation the tube is withdrawn and the gastric wound is allowed to heal. The author reports 3 cases in which he performed this operation.

Pautaloni² advocates the performance of **posterior gastro-enterostomy**, the opening being the shape of the letter Y. He uses sutures without any artificial aid. He states that after this operation the food is readily passed from the stomach into the duodenum. There is no regurgitation from the duodenum into the stomach and bile does not enter the stomach. It is of the most vital importance to keep up the patient's strength during the first 24 hours after the operation, and this can best be done by giving food promptly after the operation. This operation establishes a new pylorus of a very satisfactory description.

Maurice H. Richardson³ makes some remarks on the diagnosis and surgical treatment of **perforated gastric ulcer**. He says that with the progress of medical and surgical science the mortality in ulcer of the stomach should diminish; that the mortality should diminish demands that only such cases be referred to the surgeon as are incapable of cure medicinally; that indiscriminate surgical treatment would destroy many patients who can be cured medicinally, just as unintelligent medicinal treatment might withhold the patient's only chance of cure. If we judge by hospital records, ulcer of the stomach is comparatively frequent, and Ewald maintains that 5 % of the adult population suffer from the disease. Richardson says that if he judged by his own experience purely, the complications and emergencies of gastric ulcer must be extremely rare, and in a number of years he has never operated at the Massachusetts General Hospital except for the relief of some of the remote results of ulcers. In his private practice he has operated but twice. Perforations and hemorrhage from gastric ulcers are relatively infrequent as compared with other abdominal emergencies. Of course, that this is his experience does not prove that it is the universal one. There may have been failure of physicians to recognize the emergency or failure on his part. Perforation from unsuspected ulcer is most likely to be observed in private practice, though perforation from recognized ulcers is more common in hospital practice. Perforation of gastric ulcer is one of the most fatal of

¹ Centralbl. f. Chir., No. 39, 1899.

² Rev. de chir., Nov., 1899.

³ Phila. Med. Jour., Feb. 3, 1900.

lesions. Prompt surgical intervention, and this alone, will effect a cure. It is therefore important to understand the first signs that indicate perforation. Very few patients with perforation recover without operation, but there are on record 12 cases of undoubted perforation which recovered. Large numbers are saved by operation. Bidwell's statistics would indicate that the mortality after operation is 40 %. Mikulicz's statistics would indicate a mortality of nearly 68 %. Weir and Foote estimate the mortality at 71 % ; but of those operated on in the first 12 hours, only 39 %. Richardson thinks that the percentage of recoveries usually stated is too high, because operators are apt not to report their fatal cases. The reports of the Massachusetts General Hospital show but 1 recovery in 10 cases. None of these cases were operated on earlier than 24 hours after the perforation. The perforation and the deaths were due to general peritonitis. The success of operative intervention depends upon its promptness. If general peritonitis exists, the prognosis depends chiefly upon the nature and extent of the infection. The prognosis depends, too, upon the amount of the infection, the material, the rapidity with which it is extravasated, and the strength and extent of limiting adhesions. If there is fully established general peritonitis, intervention is still proper, unless the patient is hopelessly moribund.

Richardson then discusses the symptoms and diagnosis of perforated gastric ulcer. He says that acute pain, shock, tenderness, rigidity of the upper abdomen, vomiting, and a history of even trivial dyspeptic symptoms should incline opinion toward perforation rather than any other acute abdominal lesion. Pain is the most important symptom. But are we to make a diagnosis of an acute lesion demanding surgical intervention from pain alone? If we do, will we not some time open the abdomen because of an error of diet? We shall, unless we weigh the pain itself and the symptoms which precede and accompany it. Pain, however severe, does not justify intervention if it is unattended by peritoneal shock, for it might be due to gastralgia, ordinary colic, or the passage of a gall-stone. Even when preceded by a history of gastric ulcer, pain without the symptoms of peritoneal shock does not justify the diagnosis of perforation. When the diagnosis of gastric ulcer is not reasonably clear, and when there is uncertainty as to the exact lesion, it is yet obvious that there is an acute and dangerous lesion under headway in the upper abdomen, and immediate operation is necessary. Of course, there is a possibility of unnecessary operation. If an unnecessary operation is performed, the chagrin is great, though the danger is slight. The greatest good to the greatest number will be attained by operation when the described conditions exist. The incision should be median, as this permits of the most satisfactory exploration. Through the median incision the surgeon should examine the stomach and gall-bladder, the pancreas, the spleen, and the kidneys. In case a one-sided lesion is discovered, a second incision may be needed to carry out the necessary operative procedures. If the symptoms point to a definite area of the upper abdomen which is not accessible through a median incision, the cut may be made directly over this area. The moment the peritoneum is reached there are evidences of

trouble, for it will bulge into the wound, being forced forward by gas, serum, blood, stomach-contents, or whatever constitutes the extravasation. These fluids indicate surely an organic lesion of some sort. Gas and intestinal contents point to extravasation from the alimentary canal; blood, to the pancreas; pus, to a ruptured abscess; turbid serum, to a beginning peritonitis; bile, to a ruptured gall-bladder; and simple serum, to almost any acute or chronic lesion. The direction in which the search must be conducted will be determined by these fluids, and time should not be wasted in a general exploration. If gas is present, a search for a perforation must be at once made. First examine the stomach, next the transverse colon, and finally the duodenum. If bloody fluids are present, the cavity of the lesser omentum should be promptly opened and the pancreas examined. When bile is found, the region of the gall-bladder should be explored. No other fluids are guides. Pus, turbid serum, or simple serum may have origin from many lesions of the upper abdomen, and when one of these fluids exists, and no other, the search for the lesion must be systematic and in the order of accessibility: that is, the viscera of the cavity of the great omentum should be explored before opening the lesser omentum. In suspected perforation of the stomach the anterior wall should be examined carefully by inspection and by the fingers. It may be possible to determine the presence of an ulcer of the posterior wall by digital examination before the cavity of the lesser omentum is opened. If nothing is observed by examining the anterior wall, the omentum should be inspected between the stomach and the transverse colon; and if nothing escapes after division of the omentum, the diagnosis of perforated gastric ulcer was a mistake.

When a perforation is found, the first duty of the surgeon is to prevent more extravasation; his second is to remove the fluid which is already extravasated; and the third is to antagonize as much as possible the injury done to the peritoneum and to provide against advancing peritonitis. In most instances the condition of the patient is such that only the simplest and most rapid methods can be employed—methods in which security must be sacrificed to speed: suturing, it may be, to gauze drainage; careful cleansing to brief irrigation. In other words, the methods employed will depend upon the case and upon the condition of the patient. A patient who survives a hasty effort at repair is better off than one who dies after the most perfect operation. In desperate cases simple incision, irrigation, and drainage may be better than a perfect operation from which the patient emerges in a moribund condition. The surgeon must always be on his guard, however, not to underestimate the patient's strength and to fail in thoroughness when it is not necessary. Again, he must remember that in certain abdominal lesions thorough repair is essential, regardless of the danger; cases in which if thorough repair is not carried out death will be inevitable. In such mechanical diseases as volvulus, embolism or thrombosis of the mesenteric vessels, and internal strangulation of the intestines, gangrene of the coil will result from any imperfect operation. The least that can be done in such conditions is to make an artificial anus. In perforation of the stomach

the least that can be done is to provide drainage for the extravasated fluid ; to prevent further infection of the lower abdomen by the insertion of barriers of gauze ; and to drain the site of perforation with gauze wicks. In favorable cases, however, the most thorough method should be employed. Careful closure of the perforation by one of several methods can be carried out according to the location and size of the opening, the plasticity of the wall of the stomach, and the desirability of excision of the ulcer. It is rarely advisable to excise the ulcer for perforation. Excision is practised only when the ulcer is in an easily accessible situation, when it is of small size, when it is surrounded by healthy stomach-wall, and when the patient is in good condition. Of course, excision furnishes the possibility of immediate and permanent cure, not only of the perforation, but of the ulcer. On the other hand, even when excision is not practised, there is a greater possibility of recovery from the perforation and good prospects of ultimate cure of the ulcer.

So extensive and prolonged an operation is very rarely justified by the patient's condition. The simplest and quickest method is to effect direct closure by inverting the edges of the ulcer. If the perforation is small and the gastric tissue pliable, the opening may be closed by a purse-string suture. If the opening is $\frac{1}{4}$ of an inch in diameter, Lembert's sutures may be used, being introduced $\frac{1}{2}$ of an inch beyond the ulcer ; the needle emerging, say, $\frac{1}{4}$ of an inch nearer the perforation. Several sutures must be inserted before tying is practised, for a single suture will often tear out of tissues that will hold 3 or 4 satisfactorily. As soon as the necessary number of sutures have been inserted, the ends are pulled open, the inverted edges of the perforation are brought together, and the knots are tied. Additional sutures may now be inserted at the ends, and a second row may be placed over all. If sutures applied close to a perforation tear away, they must be reinserted further away, the process often being an infolding of the gastric wall rather than an inversion of the edges of the ulcer. This causes the muscle to project into the stomach at the apex of a fold. If the stomach-wall is extensively infiltrated, if it is edematous, or if it tears easily, excision is out of the question and inversion may be impossible. In such a case we must make attempts by some means other than suturing. In a case of Richardson's a drainage-tube was carried directly into the stomach, the tube being slightly larger than the perforation. This tube was a protection against extravasation, a means of drainage, and a route for feeding and lavage. This expedient might have succeeded but for a perforation on the posterior wall, which proved fatal. If closure by suture, by excision, or by the use of the drainage-tube is impossible, the only remaining expedient is the use of gauze. The gauze should be packed spirally around the perforation from the stomach to the abdominal wound. It makes a sort of well, at the bottom of which is the perforation. One method is to apply numerous strips long enough to reach from the margin of the perforation outside of the abdominal incision. The strips are in contact or overlap each other and radiate from the walls of the stomach. This use of gauze may protect the general

peritoneal cavity from further extravasation and direct the extravasated matter into the outer dressings. Gauze inserted between the abdominal wall and the transverse colon will protect the lower abdomen. Gauze to the right and left will protect the gall-bladder area and the splenic area. Even if the stomach-wall has been inverted and sutured, provision must be made against extravasation, because there is more likely to be extravasation than after an operation on a sound gastric wall. A few strands of gauze should always be carried from the suture line to the outer dressings. After closing the perforation the infected area should be cleansed by dry wiping and by irrigation with salt solution. If the lower part of the abdomen is infected, the incision may be continued to below the umbilicus, or a second incision may be made below the umbilicus, through which the peritoneal cavity can be cleansed. Dependent drainage may be made in the flanks. The gauze strand should be removed in 4 or 5 days. If, on removal of the drain, the depths of the wound are found to be dry, only a very small strand will be required. If the sutures are found to have given way, the gauze must be so arranged as to aid the escape of fluid, and the wound should be allowed to close gradually. If a gastric fistula forms, care should be taken to make the escape of fluid easy, and we may confidently expect spontaneous closure. Feeding must be by the rectum for 48 hours and then by the rectum and the mouth. Liquids are first given in teaspoonful doses at gradually lessening intervals. Richardson then reports a series of strikingly interesting cases.

Barker¹ makes a report upon 12 cases of **perforated gastric ulcer** upon which he has operated. Five of the cases recovered. Two of the cases which died lived for 2 weeks. The first died from a subphrenic abscess and pleural pneumonia, and the second from hemorrhage from the ulcer into the stomach. This fatal case due to hemorrhage shows the advisability of excising the ulcer whenever possible. In all the cases the abdominal cavity was wiped out rather than flushed, particular care being given to the space between the liver and diaphragm. Drainage was used in only 1 case, and was then found to be unnecessary. In every case a vertical incision was made, and in 1 case it was found necessary to enlarge this toward the side. In the 5 successful cases the average length of time after the perforation at which operation was performed was $11\frac{3}{4}$ hours: $6\frac{1}{2}$ hours in the shortest case; 18 hours in the longest case. In the 7 fatal cases the average length of time was $30\frac{1}{2}$ hours. In half the cases there was no collapse, but in all the cases there was severe pain. In 6 of the cases liver dullness was present and in 1 of the cases it was not even diminished.

Leonard A. Bidwell² writes on **operations in gastric ulcer**, and has collected 55 cases of gastric ulcer operated on in the last 2 years. Thirty-three of these patients recovered. In 25 of the cases that recovered the length of time intervening between perforation and operation is stated. In 8 cases operation was within 6 hours; in 5 cases it

¹ Lancet, Dec. 16, 1899.

² Am. Jour. Med. Sci., Sept., 1899.

was between 6 hours and 12 hours ; in 7 cases it was between 12 hours and 24 hours ; and in but 5 cases was it performed after more than 24 hours. If we take up the 23 fatal cases, the time is stated in 17. Not one of these was operated upon within 12 hours. Seven were operated upon between 12 hours and 24 hours, 6 between 24 hours and 48 hours, and 4 after 48 hours. These figures show the great importance of early intervention, because they show that all the cases operated on within 12 hours were saved, whereas of the 15 cases operated on after 24 hours, only one-third were saved. Bidwell points out the symptoms which should lead the surgeon to make a diagnosis of perforation, and says that perforation should be suspected in every case in which there is the sudden onset of abdominal pain with shock. He does not believe in excising the ulcer ; prefers, rather, inversion by Halsted's or Lembert's sutures, the sutures being inserted at a considerable distance from the margin of the ulcer, otherwise they will cut out when tied. Solid matter exuding from the stomach should be wiped away and the peritoneal cavity should be flushed with salt solution. A drain should be placed over the ulcer and a second incision should be made over the pubes to permit of the insertion of a glass drain in Douglas' pouch. Bidwell believes that in certain cases of unperforated ulcer operation should be performed : namely, cases in which there have been severe attacks of serious hemorrhage or cases in which cicatrization of a pyloric ulcer has led to stricture of the pylorus with dilatation of the stomach. If an ulcer is operated upon because of hemorrhage, the stomach should be opened and a purse-string suture carried around the base of the ulcer.

William L. Rodman,¹ in a valuable paper read before the American Surgical Association at Washington, has gathered together the **statistics of nonperforating gastric ulcer and operations for hemorrhage**. The article is an extremely valuable one for reference.

Armstrong² discusses the question of **operation when hematemesis and melena arise from gastric or duodenal ulcer**. He says that in profuse bleeding from the stomach or intestine, aneurysm and leukemia should be excluded ; and when this has been done, the surgeon should interfere in certain cases. He says that the surgeon should interfere if there have been many small hemorrhages which are not arrested by medication and diet, and which are gradually sapping the strength of the individual ; and, second, in large hemorrhages which recur in spite of medicinal and dietetic treatment. After the second large hemorrhage he thinks that an operation should be performed. Hemorrhage due to cirrhosis and portal obstruction will not be benefited by operation. The hemorrhage is due in these cases to varicose esophageal veins, which are exceedingly difficult to reach, and the primary lesion of the liver is not amenable to treatment. In the case of a gastric or a duodenal ulcer the bleeding point can be reached locally and the operation will save the patient from the danger of perforation. In these cases it may be advis-

¹ Phila. Med. Jour., June 9, 1900.
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² Brit. Med. Jour., Oct. 21, 1899.

able to give the ulcerated part rest by the performance of a gastro-enterostomy or a pyloroplasty.

Andrews and Eisendrath¹ write on the **surgical treatment of hemorrhage from gastric ulcer**, and report two cases. They advocate opening the abdomen in the middle line, making a vertical incision in the anterior wall of the stomach, and placing a strong ligature about the ulcer and drawing it upward in order to constrict it and make a cone. The authors maintain that if medicinal treatment does not improve the patient's condition, bleeding ulcer of the stomach will inevitably prove fatal without surgical intervention. They indicate surgical intervention for repeated small hemorrhages or for severe bleeding which occurs more than once. They consider the loss of 500 cc. to be the amount meant by severe bleeding. It is not justifiable to operate because a person has had a single severe hemorrhage. If an ulcer is at or near the pylorus, pyloroplasty should be performed, because this incision permits of direct treatment and gives all the future benefits of gastro-enterostomy. It is not advisable to cauterize or curet the ulcer in cases in which it is possible to resect it from without. If the ulcer is on the posterior wall of the stomach and adherent to the tissues outside, or if it is near one end of the stomach, excision is not possible, and the surgeon should then either ligate *en masse* or cauterize and curet. Ligation *en masse* is liable to be followed by perforation unless external sutures are also inserted.

Von Eiselsberg² reports 8 cases of **postoperative hemorrhage** from the stomach and the duodenum. Several of these operations were for hernia; 2 were for cancer of the rectum; another was for malignant disease of the tonsils and cervical glands. In some cases free hemorrhage took place from the gastric mucous membrane; in others, recent erosions formed. In 1 there was recent ulcer of the duodenum and the stomach. In 1 there was a single duodenal ulcer, the hepatic artery having been perforated. In another there was a duodenal ulcer which opened into the gastroduodenal artery. In 6 of the cases there was hematemesis, and in 2 hemorrhage of the stomach was found after death. Three of these patients recovered and 5 of them died.

Reichard³ reports 3 cases in which **sudden hemorrhage from the stomach occurred after operation**. All the cases died. In one of the cases the fatal hemorrhage occurred a few days after an abdominal section. In the 2 other cases the patients had entirely recovered from the operation. Postmortem examination did not disclose any reason for the hemorrhages.

Mayo Robson,⁴ in his Hunterian Lectures, reports 7 cases of **postoperative hematemesis**.

Wm. L. Rodman⁵ discusses **postoperative hematemesis**. He says: "It is significant that nearly all the cases reported by Robson and Eiselsberg were instances of operations upon the intestines, omentum,

¹ Ann. of Surg., Oct., 1899.

² Arch. f. klin. Chir., vol. LIX, part 4, 1899.

³ Centralbl. f. Chir., No. 5, 1900.

⁴ Lancet, Mar. 10, 1900.

⁵ Phila. Med. Jour., June 9, 1900.

and structures adjacent to the stomach. The anesthetic could not have been responsible for the vomiting of blood, for in one of Robson's cases cocaine was used, and a cholecystotomy for carcinoma of the bile-ducts completed in 15 minutes. In several other cases there was no vomiting after the operation. Robson states that in 6 of the cases the omentum was ligated, and in another it was probably contused. He also says that 'in an experiment on an animal multiple hemorrhages into the stomach followed twisting of the omentum.' Robson has also kindly given me, in a letter, details of a case of stab wound of the abdomen. He says: 'I explored the abdomen for a stab wound, and as the patient was vomiting blood, I expected to find a wound of the stomach, but discovered no perforation of the stomach-walls, though I had to ligate the superior mesenteric vein, the patient making a satisfactory recovery. The hemorrhage was doubtless due to bruising of the mucous membrane without rupture of the peritoneal coat.' The explanation given of the hematemesis in this patient is satisfactory and rational, and could not well have resulted in any other way. I do not, however, understand why operations upon the omentum should cause postoperative hematemesis, as I can see no anatomic explanation for it. At first it would seem theoretically that twisting the omentum might force into the venules of the mucous membrane an amount of blood which they could not accommodate, and some weak vessel give way, causing hemorrhage into the stomach, notwithstanding the great capacity of veins to undergo enormous dilation without rupture. I have, with the assistance of Burns and Woody, experimented upon 4 dogs, endeavoring to, if possible, cause hemorrhage into the stomach by rapid and severe traumatism not applied to the stomach itself. In the first experiment a large dog was chloroformed, the omentum twisted into a rope, ligated high up, and then resected. The stomach was at once cut into, and there was no suggestion of even hyperemia from cardia to pylorus. The stomach was then removed, tacked upon a board, and photographed at once by Kassabian, who was present for that purpose. In experiment No. 2 a medium-sized young dog was chloroformed, the omentum twisted rapidly into a rope, and ligated high up. In addition, I squeezed the spleen and pancreas so forcibly that I ruptured the former to a slight extent, hoping by the compression to force enough blood from these organs, whose blood supply is so intimately connected with that of the stomach, into the gastric mucosa to cause rupture of some of its vessels. The stomach was immediately opened and found to be perfectly normal in every respect, quite as much so as in case No. 1. In experiment No. 3 the dog was chloroformed, the omentum twisted into a rope, and the small intestines were compressed and squeezed for more than would or could be done in any operative procedure, Burns at the same time compressing the liver so as to interfere with the portal circulation. The stomach was then rapidly opened and found perfectly normal. The dogs were not allowed to come from under the anesthetic, and in all the stomach was quite empty, food having been withheld for some hours. In experiment No. 4 a medium-sized dog (female) was chloro-

formed, the omentum twisted into a rope, ligated high up, and resected. The wound was then closed with ordinary aseptic precautions, and the animal made a rapid and painless recovery. There was no vomiting of blood or blood in the feces at any time during the 3 weeks that the dog was kept under close observation in the laboratory. It ate well soon after coming from under the chloroform, and never had a bad symptom.

"Of the 50 surgeons written to, only 9 have seen postoperative hematemesis. Three operators—Johnston, of Richmond, Parrish, of Philadelphia, and Wathen, of Louisville—have each had one case of gastrorrhagia following hysterectomy. All occurred within a week after operation, 1 being fatal. Clarke and Noble, of Philadelphia, have each seen fatal hemorrhage from duodenal ulcers after operation. The former does not give the exact nature of the operation, but it was intrapelvic. Noble states that his patient was a woman, about 60, operated on for ventral hernia. Hemorrhage that was quickly fatal occurred on the tenth day after operation. Autopsy showed a marked duodenal ulceration. Noble and Wathen have each had a fatal case of hemorrhage after nephrorrhaphy. Noble operated on both kidneys in a young woman. Death occurred on the twelfth day as a result of hemorrhage from the stomach and bowels. No autopsy was allowed. Wathen's patient was a highly neurotic young woman. She began vomiting blood more than a week after operation, and died 2 or 3 days later; no autopsy. Johnston has also reported cases of hematemesis following operations for ovarian tumor with a twisted pedicle, suppurating ovarian cyst, strangulated hernia, and extra-uterine pregnancy. The first 3 were fatal and accompanied with general peritonitis; the last recovered. Three others have seen postoperative hematemesis, but it followed operations upon the stomach itself; these were apparently cases of secondary hemorrhage, and are therefore excluded. I have been particular to make inquiries as to the frequency of hematemesis after hernia operations, as Robson and Eiselberg have both seen it. Of the 50 surgeons written to, only 2 have encountered it, and 1 of the cases was a strangulated hernia with general peritonitis. The other was the case operated for ventral hernia, and who died from a demonstrated duodenal ulcer. In more than 100 herniotomies—strangulated and nonstrangulated cases—I have never encountered it. It is possible to quote from only a few of the many surgeons communicated with: W. T. Bull, of New York, writes: 'I have never seen hematemesis after any operation. I fancy I have had 650 herniotomies.' W. B. de Garmo, of New York, writes: 'I have never seen in any of my own cases one of hematemesis following operation. In replying to your second question, I would say, I have done 653 herniotomies; of these, 573 have been by the Bassini method for the cure of inguinal hernia.' W. B. Coley, of New York, says: 'I have never seen a case of postoperative hematemesis. I can not tell in how many cases I have removed omentum, but in a large number. You could say that in over 700 cases of hernia operations I have never seen it.' J. M. T. Finney, of Baltimore, writes: 'In my own personal

experience I can not recall an instance of postoperative hematemesis following hernia, or any other operation in which the omentum was involved, nor have I known of any taking place in the Johns Hopkins Hospital.' The sum total of all the hernia operations done by the 50 surgeons to whom I have written must be many thousands, and yet but two cases of postoperative hematemesis are reported, and each has been satisfactorily explained: one dying of general peritonitis, following strangulated hernia; the other, from a duodenal ulcer demonstrated at autopsy. All the cases seen by Robson and Eiselberg followed intra-abdominal operations, such being also the case with all postoperative hematemeses reported by American surgeons, except 2 cases, in which nephrorrhaphy had been done. In doing nephrorrhaphy the peritoneum may, in the first place, be incautiously opened by the most careful operator; and, secondly, there is always a considerable amount of traumatism necessary to force the kidney into the lumbar incision. It is not, therefore, difficult to understand how a hematoma may easily be produced by the great abdominal pressure oftentimes necessary to bring the kidney into view, and how, furthermore, this extravasation may occasionally cause sapremia, septicemia, or peritonitis, according to circumstances. All septic conditions favor disintegration of the blood-corpuscles and predispose to hemorrhage from mucous surfaces. The gastric mucosa is particularly liable to congestion in conditions of sepsis, both on account of the marked tendency of the thin and more or less disintegrated blood to settle in the internal organs, and the vomiting and retching so frequently present. We have, I think, in this a satisfactory explanation of the rare hematemeses following abdominal operations, and have shown that even violent traumatism to the omentum, intestines, spleen, pancreas, and liver do not produce immediate hemorrhage into the stomach in any of the dogs experimented upon, and it does not seem unreasonable to suppose that delayed hematemesis will usually depend upon disintegration of the blood due to sepsis."

William H. Bennett¹ delivered a lecture on some cases of **dilation of the stomach from the surgical aspect**. He says that there are two different classes of cases of dilated stomach: the persistent and the intermittent. In the persistent cases the stomach-walls have lost their natural power of contraction. In the intermittent cases the contractile power is retained for long periods, though in the course of time it is gradually lessened or disappears. Intermittent obstruction may arise from spasm of the sphincter of the pylorus or from intermittent mechanical obstruction of the pyloric lumen. Persistent dilation is always due to permanent pyloric obstruction, to adhesions, or to some other condition outside of the stomach which interferes with its power of contraction. Intermittent dilation may be caused by ulceration or growth of the stomach, but it is usually due to irritation produced by abnormal conditions outside of, but not implicating, the stomach. The commonest cause of intermittent dilation is movable kidney, but any floating abdominal tumor,

¹ Brit. Med. Jour., Feb. 3, 1900.

especially of the right side, may give origin to the necessary irritation. Dilation of the stomach due to movable kidney is limited to cases in which the affected kidney is on the right side. We must always bear in mind that for practical purposes gastric dilation is always secondary to some gross cause. It is a symptom of an underlying disease. We should examine to see whether there is a tumor in the pyloric region. If there is no tumor, the abdominal parietes should be examined to see whether there is any primary cause, such as umbilical hernia. Careful search should be made for movable kidney or any other movable abdominal tumor, and this can be carried out satisfactorily only when an anesthetic has been given. In some cases a dilation of the stomach will rapidly disappear under an anesthetic because of the consequent relaxation of a spasm of the pylorus which has been produced by reflex irritation. We constantly hear that a splash within the stomach is diagnostic of gastric dilation—a splash developed by succussion; but, as a matter of fact, this splash is not confined to cases of dilation of the stomach. It may be met with when there is dilation of the colon, and the differentiation between the splash of gastric distention and the splash of distention of the colon is extremely difficult. In all cases it is wise to clear up doubt by emptying the stomach as quickly as can be done by siphonage, which removes the possibility of the existence of a gastric splash. Absence of liver dullness may be noticed in cases of gastric dilation. Bennett states that the methods and instruments of Einhorn and Türk for the diagnosis of gastric conditions are yet on trial, and are not likely to be part of the armamentarium of an ordinary practitioner. Gastric dilation consists of three stages: The first is the stage of irritation. There is resistance to the emergence of fluid from the organ and the organ becomes irritable. It lessens the obstruction, and, as a consequence, there is pain, occurring at first only when the stomach is most active: that is, after taking food. Hence, at this stage the symptoms of gastric dilation are the symptoms of irritating dyspepsia. As the dilation increases we reach the second stage. In the second stage there is either a condition of tolerance, the patient not having pain,—the viscus, it is true, containing a considerable quantity of material, but the patient suffering only from a general sense of fullness and an absence of appetite,—or the condition may be associated with continued pain under the liver, which becomes worse after taking food. In some of these cases vomiting follows the ingestion of food. In the third stage there is great dilation, with recurrent irritability due to fermentation of the stomach-contents, which produces periodic vomiting of great quantities of sour and offensive material. The first stage of dilation of the stomach does not call for surgical intervention. In the second stage the question of surgical intervention must be considered, and these cases may be divided into two forms: those in which the symptoms merely produce discomfort, and those in which there is severe pain below the liver, increased by taking food. In the class in which there is mere discomfort medicinal treatment,—especially the administration of antispasmodics,—stomach lavage, and abdominal massage give much comfort to the patient,

although they do not effect a cure. In the painful cases an exploratory abdominal section should be made, it having been determined before, however, that there is no hernia or other condition of the abdominal wall which may be producing a harmful effect on the stomach. With regard to intervention surgically in cases of gastric dilation in general, the greatest benefit will follow if treatment is undertaken before dilation has been followed by organic changes in the wall of the stomach—atrophy, for instance; because atrophy will so impair the functional power of the stomach that even when the abnormal cause of the dilation is removed the stomach-wall can not become normal. In other words, in dilation of the stomach surgical treatment should not be too long delayed. Hence, in the third stage of the complaint the chance of cure is small. Cases in the third stage should be managed by lavage and massage, unless life is intolerable, when surgical interference is justifiable. The first essential in surgical treatment is to ascertain whether there is any abnormal condition about the parietes, such as a small umbilical hernia; next, if there is a movable kidney or other abnormal intra-abdominal condition, and any abnormal condition outside of the stomach should be first dealt with. If no such condition is observed, we are justified in assuming that the cause of the dilation is in the stomach itself, or immediately around it. An exploratory celiotomy is performed to determine the condition. If a growth exists, it is removed or gastro-enterostomy is performed. Adhesions of the stomach to adjacent parts are divided, and if pyloric thickening exists, pyloroplasty is performed. In a considerable number of cases in which exploratory incision has been performed no evidence of obstruction could be made out by manipulating the organ from its external surface; and yet in some of these very cases pyloric obstruction, sometimes of a great degree, exists. Therefore in all cases after the performance of abdominal section for dilation the stomach should be opened on the cardiac side of the pylorus, even if manipulation fails to detect any evidence of thickening or disease; and by thus incising the wall of the stomach the surgeon is able to examine the pyloric sphincter. If examination shows that there is no contraction of the lumen of the pylorus, the sphincter must be stretched until it will allow 2 or 3 fingers to lie loosely in it.

Bidwell,¹ in a paper on the **surgical treatment of dilated stomach**, says that the principal causes are cicatricial contraction of the pylorus, malignant disease, gastroparesis, atony, and floating kidney of the right side. He looks upon the following symptoms as indications for operation: Pain limited to the pyloric region and back; evidences of dilation of the stomach; vomiting of solid food; the absence of free hydrochloric acid from the vomited matters; loss of flesh; and constipation. If malignant disease exists, pylorotomy or gastro-enterostomy may be performed. When there is nonmalignant stenosis, we can perform pyloroplasty, Loreta's operation, gastro-enterostomy, or pylorotomy. Adhesions should be divided. In a neurotic case, if lavage

¹ Lancet, Jan. 13, 1900.

and massage fail, gastropexy may be performed to correct gastroptosis; or an operation may be performed to lessen the capacity of the stomach by folding inward a portion of its walls.

Horrocks,¹ in an article on **gastroplication for dilated stomach**, says that the most fixed points of the organ are the cardiac end, the pyloric end, and the lesser curvature; and when the stomach is dilated, the position of these parts is but slightly altered. The greater curvature is, however, very much lowered, and extends well to the left of the middle line; hence, when the patient is upright, if he has a dilated stomach, the greater curvature is lower in relation to the pylorus than in a healthy stomach, and hence the difficulty of emptying the stomach is increased. In addition, there is the muscular weakness of the thin walls of the dilated stomach; the cavity is never completely emptied, and fermentation occurs. In a case in which Horrocks performed gastroplication with catgut the result was a failure; but a second operation was performed, the stomach being sutured by means of silk, and the patient was greatly relieved.

Cumston² reports a case of **hour-glass stomach**, for which he operated as in the operation of pyloroplasty. He cut through the stricture by a horizontal incision 4 inches long on the anterior wall of the stomach and sutured it up transversely to the long axis of the stomach. The patient was fed by the mouth on the sixth day after the operation. The operation completely relieved her of the pain and vomiting.

George G. Hopkins³ reports a case of **gastrotomy for foreign bodies in the stomach**. The patient was a freak, and had swallowed the most extraordinary collection of materials. He removed from the stomach 129 common pins, 6 hairpins, 2 horseshoe nails, 11 wire nails $2\frac{1}{2}$ inches long, 1 wire nail 2 inches long, 2 door-keys, 2 steel watch-chains, 1 brass watch-chain, and 1 finger-ring with a stone in it. The patient made a complete recovery. W. S. Halsted⁴ reports a case in which he extracted 208 foreign bodies and 74 grams of glass from the stomach after **gastrotomy**. The man was a carpenter, and made his living by swallowing glass, tacks, etc. He gave a performance before a number of medical students and swallowed a number of articles. A short time afterward he vomited a dark fluid, but none of the foreign bodies, and after vomiting he experienced a violent pain in the epigastric region and back. Since then he has attempted to eat regularly, but vomiting followed every meal, the distress being severe. The vomited matter was green. He was operated on 5 days after his exhibition. After the abdomen was opened the stomach was found so heavily weighted with the mass of iron that it could not be drawn into the wound, and Halsted did not like to pull it up from behind lest its posterior wall should be injured or perforated by some of the sharp objects. He succeeded in gently drawing a portion of the anterior wall to the surface. An incision was made large enough to admit 2 fingers

¹ Ann. of Surg., Sept., 1899.

² Phila. Med. Jour., Mar. 10, 1900.

³ N. Y. Med. Jour., Dec. 9, 1899.

⁴ Johns Hopkins Hosp. Rep., vol. ix.

after the abdominal cavity had been walled off with gauze. He was afraid he would let minute fragments of glass fall into the abdominal cavity, so in order to prevent that, he sewed a strip of fine linen to the circumference of the wound in the stomach, thus making a funnel which would catch even the finest spicule. It required $2\frac{1}{2}$ hours to remove all the foreign bodies which could be felt. Several times Halsted thought that all the bodies had been removed, when stomach peristalsis would bring something more within reach. He sewed up the stomach wound completely, disinfected the hands thoroughly, made a fresh toilet of the abdominal cavity, palpated the stomach, which could now be drawn easily into the wound, and found that a knife-blade and several smaller objects were still present in the stomach. A second incision was then made in the stomach, nearer to the cardiac orifice than the first, and from this second incision the other objects were removed. The second wound was closed, as was the first, with a double row of mattress sutures. Some of the bodies were removed with forceps, some of them with the scoop. More damage resulted from the use of the scoop than from the forceps. On examining the wall of the stomach after the operation was completed 2 minute subperitoneal extravasations, pinhead in size, were discovered on the posterior surface of the fundus. The abdominal wound was closed with silver wire. This patient recovered.

Wm. J. Mayo,¹ in a paper on the **surgical treatment of diseases of the stomach**, says that from a surgical point of view the stomach is a favorable organ for surgical work, far more so than the intestines. Its blood supply is from several different sources, so that even very large incisions may be expected to heal. Its mucous coat is very thick and can be easily separated from the muscular and peritoneal coats. Hence sutures can easily be introduced, and the gastric juices, while they are not germicidal, are hostile to bacteria. It has been shown by Cushing that the contents of the upper part of the alimentary canal are far less septic than the contents of the lower part; and gunshot wounds of the upper part of the intestinal tract are more likely to do well after operation. The fact that the stomach is somewhat fixed favors the localization by adhesions of gastric perforations. This is in marked contrast with the rapid dissemination through a like lesion in the wall of the intestine. The unfavorable element in perforation of the stomach is more in the large quantity of material which the stomach will contain than in its virulent character. Mayo's operative experience comprises 60 cases. Fifty-three of these have been operated upon in one hospital and have been under his own direction throughout. These 53 cases he uses for his statistical inquiries. There were 23 operations for malignant disease; 8 cases of gastro-enterostomy; 2 cases of gastrotomy; 3 cases of pylorectomy with gastroduodenostomy; and 10 cases of exploration. In this series of 23 cases there were 4 deaths—3 deaths after gastro-enterostomy and 1 after gastrotomy. Two of the deaths were in reality produced by aspiration pneumonia, and 2 of them from a form

¹ Phila. Med. Jour., May 3, 1900.

of exhaustion often seen after abdominal operations for malignant disease due to a sudden failure of vitality coming on about the fifth day. There were 30 cases of nonmalignant disease operated upon: 15 gastro-enterostomies; 3 gastrotomies; 8 pyloroplasties; 1 for adhesions resulting from healed ulcer of the duodenum; 1 for adhesions resulting from gastric ulcer; 1 for adhesions to gall-bladder; and 1 gastrorrhaphy for gunshot wound. Among these 30 cases there was but 1 death. This was due to exhaustion after gastro-enterostomy. Mayo draws from his operative experience a series of conclusions of great practical importance.

A. W. Mayo Robson,¹ in the Hunterian Lectures, reviewed the entire subject of the **surgery of the stomach**, and a study of this valuable contribution enables us to understand the present status of gastric surgery. The article is too long for a general review.

Martin B. Tinker² publishes a valuable statistical article upon **perforating gastric ulcer** and its surgical treatment.

DISEASES OF THE PERITONEUM AND INTESTINES.

At the recent German Surgical Congress³ the question of operation for **contusion of the abdomen** was discussed. Angerer reported on 9 cases of rupture of the intestine upon which he had operated, and of these cases, 2 recovered. The prognosis depends to a great extent upon the promptness with which the operation is performed. In gunshot wounds and stab wounds operation should be undertaken as soon as possible. The diagnosis of the subcutaneous injuries of the liver, kidneys, etc., is extremely difficult, and it occasionally happens that recovery will take place without operation, although this is rare. Shock has but little value in making a diagnosis. If it continues several hours, it is probably not true shock, but depends upon lesions of the internal organs. The pulse is weak and frequent, and if peritonitis arises, becomes very rapid; septic peritonitis is indicated by increase of pulse and temperature. Many times when the surgeon sees such cases the symptoms have been rendered obscure by the administration of morphin. Pain may be entirely absent. The liver dullness will disappear only in those cases in which the rupture is near the liver, and there may be an intestinal rupture with the maintenance of the area of liver dullness. Bloody stools indicate that there is probably an injury of the intestinal mucous membrane, but not a perforation. Laparotomy should be performed in all cases in which the diagnosis is doubtful. In 162 cases of subcutaneous rupture of the intestines unoperated upon, only 11 recovered, and several of these had fistula. The surgeon should not hesitate to perform laparotomy during shock, because shock is often a sign of beginning peritonitis, and ether is not particularly dangerous in this condition. More cases die from undue conservatism than from any other cause. Angerer prefers irrigation to wiping infected areas, although

¹ Brit. Med. Jour., Mar. 10, 1900.

² Phila. Med. Jour., Feb. 3, 1900.

³ Phila. Med. Jour., June 2, 1900.

in septic conditions he eviscerates in order to permit of thorough cleansing. Even a longitudinal rupture should be closed by transverse suturing. In case of complete tear of the intestine, anastomosis should be effected by means of a Murphy button.

Rizzo¹ writes on **extravasation of urine in the peritoneal cavity**. He made a study by injecting urine into the peritoneal cavities of animals. He shows that if urine is injected into the peritoneal cavity, half the amount necessary to produce symptoms of poisoning when injected hypodermically will produce uremia. When urine entered the peritoneal cavity drop by drop, in some cases there was no reaction; in other cases the patient suffered from septicemia. A wound which opens into the urinal canal at some portion where it is covered with peritoneum may become closed by adhesions. These adhesions are not due, however, to the irritant effect of the urine, but result from the fact that a bleeding area is brought into contact with a serous surface.

E. M. Sutton² reports a case of **gunshot wound of the abdomen** in which he demonstrated that there was no intestinal perforation by infiltrating the bowel with vapor of ether. This vapor of ether escaped from the mouth. The apparatus used to effect this inflation included a rubber tube to insert into the rectum, a bicycle pump, and an aspirating bottle in which two grams of ether were placed.

Henry C. Keenan³ discusses the question of **subcutaneous rupture of the intestines**. He agrees with Curtis that in many of the so-called cases of intestinal rupture the condition is not really intestinal rupture, but is a contused lacerated wound. Curtis showed that if a weight were dropped on the abdomen from a height, the bowel would not be torn unless it were caught by the force applied to the belly-wall and the spine of bone or pelvis in the rear. The bowel is more likely to escape injury if moderately distended than if perfectly collapsed; but if a separated portion of intestine is largely distended, a genuine rupture may occur. Genuine rupture, however, is extremely rare in the living body. There are two classes of force which produce rupture: the sudden application of force, as by blows or kicks or the impaction of heavy objects; and heavy forces of lacerating nature, as buffer accidents or run-over cases. Seventy per cent. of all cases belong to the first group; 30% to the second group. The sudden sharp blow causes a single tear, while the passage of a heavy body causes usually more than one tear, and generally a separation of the torn ends. The regions of intestine most often injured are the outer end of the jejunum and the lower end of the ileum: that is, places where a movable portion of intestine is attached to one more or less fixed. Experiments on animals would indicate that by passing from the injured portion of the abdominal wall toward the spine the wounded loop of intestine can be discovered. The immediate effect of a tear of the gut may be hemorrhage and extravasation; but hemorrhage may be so slight as to cause no symptoms. After a time, because of fecal extravasation, peritonitis of a very virulent type arises.

¹ Il Policlinico, Jan. 15, 1900.

² Jour. Am. Med. Assoc., Dec. 30, 1899.

³ Phila. Med. Jour., Sept. 2, 1899.

Sometimes the bowel is not actually torn, but is contused or its blood supply is separated from it, and the gut becomes gangrenous and perforates, possibly as late as six days after the accident. Keenan then discusses the symptomatology of intestinal rupture, and advocates the early performance of an operation. He says that in a contusion the history and the symptoms should largely govern us as to the necessity for operation. With regard to the technic, he says that the incision should be made over the point at which the force was applied, and the loops of the intestines should be lifted toward the spine. After one tear is found, search for others, but avoid evisceration, and look upon any discolored area with grave suspicion, treating it as we would a rupture.

George Henry Makins¹ writes upon **traumatic rupture of the colon**, reports two cases, and discusses the cases treated in St. Thomas' Hospital between 1889 and 1898. In the first case the injury resulted from a log being thrown from a circular saw. The patient soon began to vomit, and on arriving in the hospital he was in great pain. The breathing was shallow and rapid, and he lay with his knees drawn up. The pulse was good and the temperature slightly subnormal. Examination of the abdomen showed a point where it had been slightly grazed, this point being a little above the anterior superior spine of the ilium. The abdominal wall was rigid, but there was no distention. There was general abdominal tenderness, but a spot of most intense tenderness existed in the iliac region. Emphysema was absent. The area of liver dullness was found to be normal. There was slight impairment of resonance in the right loin. Clear, normal urine was removed by the catheter. The matter vomited on admission was clearly gastric in origin. During the next 6 hours the condition became worse. Vomited matter became green, but remained inoffensive. The face became flushed and anxious. The patient sweated freely. The pulse increased in frequency and lost in strength. A median incision was made some 6 hours after the accident. A small amount of muddy brown fluid escaped, and as the pelvis was reached, this became fecal in odor and the intestines were found coated with patches of lymph. Exposure of the cecum permitted the evacuation of a blood-clot and the colon was seen to be dark red in color from ecchymosis and congestion. A longitudinal tear 2 inches in length through the peritoneal coat was found on the anterior aspect of the cecum. On its lateral aspect, at the junction with the ascending colon, a valvular opening $\frac{3}{4}$ of an inch in length was found which perforated the bowel, and from this opening fecal matter and gas escaped. There was a tract of cellular emphysema back of the colon and a retroperitoneal hemorrhage. The peritoneal tear was closed, the wound in the gut was sutured, the bruised part of the omentum was removed, and drainage was introduced. This patient recovered. The author then elaborately discusses the causation and the location of such ruptures, the symptomatology, and the proper methods of treatment. He says that a definite diagnosis of simple rupture of the intestine and

¹ Ann. of Surg., Sept., 1899.

rupture of the mesentery is often impossible, and the fact is that the two conditions may exist together. But one sign is of value in localizing injury to the mesentery: that is, the presence of a quantity of blood in the peritoneal cavity. An uncomplicated rupture of the bowel rarely causes hemorrhage, while the mesenteric rupture is invariably accompanied by free bleeding. It is very difficult, of course, if the wound has been in certain regions, to exclude injury of the solid viscera; but if this can be done, and it can be shown that the injury was in a region in which the intestine rarely suffers, the possibility of injury to the mesentery must be considered. In the 20 acute cases reported in this paper, 17 died and 3 recovered: that is, 15% recovered; but of the whole 20, only 15 were operated upon with the same number of successes: that is, 20%. Sixteen of the 20 ruptures were of the small intestine; and of these, 2 recovered. Four were of the large intestine; and of these, 1 recovered. The author then relates a second case of rupture of the colon which recovered. He believes that operation can not be done too early if the injury is diagnosticated or is even suspected; although he thinks it may be necessary to await reaction from the primary shock, combating shock by the usual methods. A median cut between the umbilicus and pubes, and a little to one side of the linea alba, is generally the best incision to make, because it will be near the site of injury. It may avoid the contused portions of the belly, while it can be extended easily, and it allows of the best possible cleansing of the peritoneum. Makins believes in cleansing the peritoneal cavity by dry sponging of the infected area, followed by irrigation, and, if necessary, the evisceration and washing of the small gut and flushing of the pelvis and peritoneal fossæ. Irrigation should not be practised before the most gravely infected area has been wiped, because to do so will simply diffuse septic material. He would avoid drainage, if possible, although drainage may be necessary because of the wide area or the severity of the infection. In such a case he keeps the external wound widely opened by means of a gauze plug leading down to the infected region.

Ernest Laplace¹ reports a case of **acute general peritonitis** treated by **continuous irrigation** with normal salt solution. On opening the peritoneum about 8 ounces of pus escaped. The appendix and a portion of gangrenous omentum were removed. The glass spout of an irrigator was inserted into Douglas' culdesac and the rubber tube was sutured to the incision in the abdominal wall. Three inches above this, a glass drainage-tube was inserted; the remainder of the incision was sutured and a gauze dressing was laid over the wound. Irrigation was continued for 72 hours at the rate of 10 pints every 15 minutes. Therefore the total flow of fluid through the peritoneal cavity was 360 gallons. The patient recovered most satisfactorily.

George R. Fowler² discusses the subject of **diffuse septic peritonitis**, and he advocates a new method of treatment. This method consists in elevation of the head and trunk in order to facilitate drainage

¹ Phila. Med. Jour., Oct. 14, 1899.

² Med. Rec., April 14, 1900.

into the pelvis. He reports 9 consecutive cases which recovered under this method. He shows that the peritoneum is in reality a large lymph-sac, and that peritonitis is really lymphangitis. When infection occurs, exudation takes place from the lymphatics and plugs up the lymph-channels, and serves to protect the body at large from poisoning. If the septic material is so virulent or increases so rapidly that these channels can not be obstructed, the general organism is rapidly infected. Rapidly acting micro-organisms may destroy life before these protective barriers can be built. Slowly multiplying organisms allow these barriers of exudation to form, and thus prevent the absorption of poison and save life. The fluid which is present in cases of peritonitis is a transudate, which in the process of its transudation lifts endothelial cells from the peritoneal lymph surfaces. These desquamated cells with leukocytes float about in the peritoneal fluid. In recent cases flakes of lymph are present in the fluid. The areas of coagulated albuminous material may be found upon the peritoneal surfaces, this albuminous material having come from the lymph-channels and the fibrin of the blood. Great numbers of leukocytes migrate to the peritoneum when there is inflammation, and attack and endeavor to surround the infecting bacteria. If there is a large quantity of fluid in the peritoneal cavity, it interferes with the contact between the leukocytes and the bacteria. One of the functions of the omentum is to bring this contact about, and it does so by moving in the peritoneal cavity—bacteria adhere to it, and are then easily attacked by the leukocytes. The power of absorption varies in different portions of the peritoneum because there are anatomic differences in its structure. The highest degree of absorption is in the diaphragmatic region, because here are large lymph-tracts with open mouths. Hence any infective material in the diaphragmatic region is absorbed with great rapidity. The lymph-tracts and the mouths are so large that they can not be closed rapidly. In the intestinal region absorption takes place with a rapidity second only to what occurs in the diaphragmatic region. In the pelvic region absorption takes place slowly. It is rich in capillary lymphatics, but has few large lymph-vessels and few stomata. The small lymph-vessels are easily and rapidly blocked; hence absorption ceases quickly in a pelvic inflammation. Reasoning from these facts, we should recognize that a septic peritoneum is a less danger in the case of pelvic invasion than is peritonitis of the intestinal or diaphragmatic regions. It has long been known clinically that septic processes confined to the lower part of the peritoneal cavity may remain quiescent and give rise to no urgent symptoms for a considerable period of time as compared with the other regions. It therefore occurred to Fowler that a proper method of treatment of septic peritonitis was to elevate the head and the trunk so as to facilitate drainage into the pelvis, and then to make free drainage at the most dependent portion. In the foregoing paper he reports 9 consecutive cases of recovery, and in a second paper¹ he reports 3 additional con-

¹ N. Y. Med. Jour., June 16, 1900.

secutive cases of recovery—12 cases in all. [This method of treatment is entirely logical, and, from Fowler's report, must be regarded as distinctly promising. It has been used with success in one serious case in the Jefferson Medical College Hospital. In this case, it is true, the organisms were staphylococci and not streptococci.]

Ebstein¹ discusses the question of **exploratory incision for tubercular peritonitis**. He has gathered together and made a study of the records of 227 cases in which operation was performed. He says that the incision is what produced the cure. Not unusually after opening the abdomen the symptoms rapidly disappear when antiseptics have not been used, when the peritoneal cavity has not been flushed out, and when tubercular areas have not been dissected away. Ebstein is very much opposed to the removal of tubercular areas, because he holds that such removal is of necessity incomplete, and that it is dangerous. Ebstein himself reports 15 cases from the Breslau clinic in which simple incision was followed by apparent cure.

Arcangeli² discusses the question why it is that **incision produces cure** in tubercular peritonitis. He has a theory that after a laparotomy results follow practically identical with those which would ensue were some powerful immunizing material to be injected. He thinks that the serous exudation which follows operation contains an immunizing material. He has tried the experiment of injecting pleural effusion into individuals with tubercular pleurisy, and of injecting ascitic fluid into individuals with tubercular peritonitis, and he is persuaded that these materials have some therapeutic value. The longer the effusion has lasted, the more powerfully curative is it when injected. He considers that the immunizing material must come from dead bacteria. Hence, according to his theory, operation in tubercular peritonitis leads to the absorption of ascitic fluid and of material in tubercles, and in this way produces immunization of the patient. [All surgeons do not believe that operation strongly tends to cure tubercular peritonitis, and it is well known that the attempt often fails. The ascitic form gives the most favorable prognosis. Wunderlich recently reported upon 10 cases of tubercular peritonitis subjected to operation. In 7 absolutely no improvement followed. Four of the patients died within 3 months. In one case a tubercular sinus formed and in another case a fecal fistula arose. Wunderlich points out that it is not proper to affirm that a cure has followed operation until several years have passed, and concludes that the curative influence of operation is not nearly so great as has been supposed. Wunderlich's conclusions will be found in the *Archiv für Gynekolog.*, vol. LIX.]

Henry T. Byford³ writes on the **intestinal treatment of tuberculous peritonitis**. He does not believe that the cure which sometimes follows surgical procedure can in reality be due to the operation. He believes that placing the patient on a proper diet and relieving him from intestinal irritation will often produce a cure in those cases with-

¹ Thesis, Breslau, 1899.

² Il Policlinico, Sept. 1, 1899.

³ Ann. of Surg., Sept., 1899.

out any further medical or surgical treatment. He treats a case of tuberculous peritonitis as follows: During the early days of an acute attack the patient is treated just as for ordinary acute peritonitis. After the first few days opium is not allowed, but hot fomentations are employed to relieve pain. Enough calomel is given to make the stools green and sufficient salines in divided doses to produce 2 or 3 soft stools daily. The diet should be fluid and given in small quantities at first; and when solid diet is returned to, it should be in a form which will not produce gas and will not leave much solid residue. The patient should be kept in bed until tenderness of the abdomen has passed away and until the evening temperature is practically normal. Later, if some rise in temperature or some abdominal tenderness comes on, the patient should again be put at rest until it passes away. He believes that salol, guaiacol, and creasote help the patient by preventing intestinal fermentation. Byford believes that the rest in bed and the regulation of the diet produces cure in these cases rather than the operation or the administration of drugs.

Maurice H. Richardson¹ writes on **acute abdominal symptoms demanding immediate surgical interference**. He considers three classes of abdominal lesions: Those in which hemorrhage, peritonitis, and intestinal obstruction respectively are the chief elements. In a long list of abdominal emergencies reported he shows that recovery depends to a great extent upon prompt interference, and that many deaths are due to delay. In every fatal case in the list, except possibly the cases of pancreatic hemorrhage and one of fat necrosis and excessive intestinal gangrene from mesenteric plugging, death might have been averted by the early employment of surgical measures. The most fatal lesions are those which rapidly produce excessive gangrene, as intussusception, embolism of the mesenteric vessels, pancreatitis, and perforating ulcers; but hemorrhage may cause death more quickly. Extravasations are often slow and localized, as in appendicitis and salpingitis. But even in these slow cases operation must not be long delayed. In rapid processes delay in operating means sure death, and in slow processes it means possible death. If all acute lesions were operated on in the beginning, the mortality, even in the worst of them, would be slight. The advantages of early operation are often lost because of failure on the part of the patient to call the physician in time. "The value of initial symptoms must be carefully weighed. Pain is common to all varieties of acute lesions. It varies in onset, intensity, and permanence. It is of such a nature as to cause immediate alarm if it is dependent upon serious causes. It is the most important sign. Upon the patient it produces grave effects, as shown by his face, which expresses suffering, anxiety, and shock. It must be differentiated from the acute functional pains of intestinal, renal, and biliary colics, of indigestion, and of cholera morbus. If owing to grave lesions, it will have, by the time the physician arrives, confirming signs of peritoneal shock. These, in

¹ Phila. Med. Jour., Sept. 2, 1899.

hemorrhage, are pallor, restlessness, feeble pulse, and low temperature. Simple faintness seen in severe abdominal pain will have given place to reaction by the time aid arrives. It can not be mistaken for hemorrhage. Pain, with beginning sepsis, has peritoneal shock with abdominal tenderness and rigidity. Of these symptoms, tenderness and rigidity are of great significance. With these, vomiting adds important evidence, though vomiting alone means little. With the signs enumerated, the question of intervention ought to be decided, for if we wait for more positive evidence we shall be too late, for this positive evidence is generally a fatal infection. [The diagnosis of an acute lesion that needs immediate operation must be made now—the determination of the exact nature of the lesion may be deferred; but a good guess can be made even at this time.] Pain, pallor, feeble pulse, low temperature, mean hemorrhage; with irregularities in menstruation and tender breasts, extra-uterine pregnancy; after operation, internal hemorrhage. Pain, shock, vomiting, tenderness, and rigidity in males mean appendicitis, even if the tenderness, pain, and rigidity are general. In women with a history of gall-stones, these symptoms mean acute cholecystitis, if any of the signs point to the gall-bladder; with a history of uterine disease or pelvic disease, salpingitis if they point to the pelvis; with bloody stools they suggest intussusception; with circumscribed resistant coils, a local intestinal gangrene or an internal strangulation; with a tender symmetric tumor in the lower abdomen, an ovarian tumor with twisted pedicle. On very rare occasions these symptoms are grossly deceptive, and mean nothing. Pain, vomiting, tympany, and distention, without shock, mean simple acute intestinal obstruction, or a chronic obstruction suddenly becoming complete. In a general way a diagnosis as to the probable cause should be made exact enough to guide the surgeon to the affected half of the abdomen. In several cases I have been led to the region furthest removed from the true seat—into the left upper quadrant for appendicitis; into the lower middle abdomen for acute cholecystitis. All these errors are emphasized to make conspicuous the difficulties of diagnosis and the need of increased knowledge. As to urgency, cases differ. Hemorrhage demands intervention the most strongly. Hardly less urgent are lesions producing early intestinal gangrene, and those flooding with septic fluids the general abdomen. The less rapid processes—slow extravasations, simple obstructions, and the like—may, from their uncertainty, justify delay. The difficulty is that these processes can not be clearly differentiated, and we may delay in the wrong case. But for the fear of unnecessary intervention, all might well be operated upon at the very onset of the pain and shock. In some cases delay is of great advantage: *e. g.*, when patients are recovering from profound shock, either of hemorrhage or of sepsis—shock so deep that the least additional burden would be fatal. In cases of doubt, exploration is indicated when the symptoms enumerated are present. A small incision will show whether we are on the right track or not; for the moment the peritoneum is nicked an escape of blood, serum, or pus will follow and prove that something serious is going on. Should no serious lesion be found,

the chances of recovery are but slightly lessened. For one unnecessary operation, a hundred necessary ones would be performed—for one life lost, a hundred would be saved. Unless intervention is practised by men of a certain amount of skill and experience the patient would be better let alone. The practice so prevalent of first magnitude operations being performed by the inexperienced, and by those so situated that in a lifetime's work they must always be inexperienced, is strongly condemned. When acute abdominal lesions are suspected, the attending physician should summon to his aid the nearest and most skilful surgeon in his community. They, after careful consideration, should decide as quickly as practicable the necessity for intervention. Having explained the difficulties in the way of positive diagnosis, and the probable disasters of delay, they may conscientiously undertake operation. The result, whatever it may prove, can then be attended by no just cause for regret."

Jeanne ¹ writes on the **differential diagnosis between intestinal obstruction and acute peritonitis**. In acute peritonitis he believes that there is always great sensibility of the rectovesical or recto-uterine pouch, and in intestinal obstruction that there is always excessive peristalsis above the seat of trouble. [In intestinal strangulation peritoneal effusion occurs to an extent which can often be demonstrated by percussion, the fluid being like that which is found in the sac of a hernia, although present in much greater quantity. Braun pointed out this fact in 1891, and Bayer, of Prague, has recently directed attention to it. Bayer shows that if peritonitis is also present, paralytic distention of the gut may for a time conceal a small area of dullness on percussion, but a marked and quickly increasing dullness shows that peritonitis has been followed by strangulation.]

John C. Munro ² discusses the question of **intussusception**. He says that all cases are surgical from the very beginning, just as truly as a strangulated hernia is. Intussusception may be produced by a sudden blow, by a muscular effort, by the dragging of a tumor, by diarrhea, vomiting or coughing, and by the existence of typhoid or tubercular ulcerations. In more than half the cases the trouble is in the ileocecal region. The symptoms which are most typical are the sudden onset of acute abdominal pain, vomiting, and the passage of stools containing mucus and blood; the attack usually coming on at night. There may be diarrhea; there may be obstipation. A tumor may be felt, but it is not of necessity the shape of a sausage. There is but little spasm until peritonitis begins. As the intestine becomes more and more constricted, congestion, stasis, infiltration, and necrosis follow. Peritonitis is likely to follow, and yet the patient may escape it, the gangrenous portion passing along the digestive tract and being voided. Intussusception may be acute, chronic, chronic with acute exacerbations, single or multiple, direct or reverse. Mechanical distention with liquids, air, or gas may be a successful treatment if employed early: that is, within the first 24

¹ Bull. et Mém. de la Soc. de Chir., Feb. 13, 1900.

² Boston M. and S. Jour., Sept. 14, 1900.

or 48 hours. In an acute case it is used with full anesthesia, the patient being inverted; but if it fails, laparotomy should be performed. Only slight pressure is justifiable (not over 2 pounds of gas is used). If a liquid is employed, the reservoir should not be over 3 feet from the patient. Many cases of rupture of the intestine have been produced by injection, and much shock is caused by the procedure. We never can be sure whether the intussusception was completely reduced by injection, because the final inch of invagination may remain unnoticed, and a recurring intussusception is probably due to the failure of complete reduction. Munro maintains that injection is justifiable in chronic cases and in acute cases if the patient refuses operation, if he is beyond surgical aid, or if he is in the first few hours of the beginning of the attack; but if the first attempt fails, it is useless to make a second. In an acute case an operation should be performed as early as possible if the simple procedure fails. In a chronic case operation should not be delayed over a week. After opening the abdomen there are various ways of dealing with the condition. We may consider artificial anus, entero-anastomosis, disinvagination or reduction, and complete and partial resection. Artificial anus has little to recommend it. There is scarcely a recovery recorded in an acute case, although occasionally a chronic case recovers after its performance. An artificial anus does not relieve the strangulation; it only relieves the distention and the obstruction. It is rarely a proper procedure. Entero-anastomosis has little more to recommend it. The intestinal current is reestablished by it, but the invagination, with all its dangerous consequences, remains. The ideal operation is disinvagination or reduction, and it should be employed if necrosis does not exist and if firm adhesions have not formed. This operation is possible only when the interference is early. If adhesions exist and the reduction is difficult, there is always great risk of tearing the bowel, and in all suspicious cases after disinvagination the area should be isolated and drained. In effecting reduction Senn advises that the edema be treated first, as in phimosis, and that then countertraction be made below the apex in order to prevent folding-in of the sheath and middle cylinder. Occasionally insufflation will greatly aid in the performance of this manipulation. If reinvagination seems likely to occur, the mesentery should be shortened. If disinvagination is not possible, resection must be performed. The simplest method is Maunsell's, or a modification similar to that proposed by Rydygier.

G. L. Kerr Pringle¹ discusses **irreducible intussusception**. He says that 5 different methods have been proposed for the treatment of the irreducible bowel: (1) To remove or excise the whole invagination and to unite the ends of the divided bowel; (2) to remove or excise the invagination and establish an artificial anus; (3) to leave the invagination and establish an artificial anus above it; (4) to short-circuit the bowel and let the invagination alone; (5) to suture the entering piece of intestine to the insheathing tube at its neck by a continuous suture,

¹ Bristol Med.-Chir. Jour., Dec., 1899.

and then, opening the insheathing tube, to extract the intussusception and to excise it within the sheath. The first method is the ideal one. Patients are rarely in condition to stand the extra shock caused by the time needed to carry out the anastomosis. It is true that Murphy's button shortens the time, but it can not be used in all cases. For instance, in the large intestine the appendices epiploicæ make the two surfaces uneven and irregular. The most satisfactory method is probably the end-to-end anastomosis by simple suture. The Laplace forceps seems to promise well as an aid in this method. The second method—that is, the excision of the invagination and the establishment of an artificial anus—appears to be the most feasible, and was practised in the case which Pringle reports—a case which, unfortunately, was fatal. Method No. 3 is the simplest, but the patient is almost sure to have resulting fecal fistula and the bowel below is in a state of gangrene until the intussusception is passed. Method No. 4 leaves the bowel to take care of itself, and the chances of peritonitis and gangrene are considerable. The fifth method, proposed by Rydygier, has a great advantage: that is, so much bowel is not removed. But this method is useless when the invaginated bowel is attached to the returning layer by adhesions to any considerable extent. It is also probable that leakage would occur, as a considerable portion of the insheathing tube is occupied by the puckered-up mesentery.

An editorial in the Medical News¹ comments on the proposal of G. H. Hunter,² of London, that **volvulus** be treated by simple **rotation of the body**. Hunter reported 4 cases in which the simple rotation of the patient's body about its long axis while in a horizontal position abolished the symptoms and was followed by recovery. Of course there is a doubt about the true lesion in any patient who is not operated upon, although Hunter's cases presented symptoms which seemed to justify the diagnosis of volvulus. The patients are told first to make gently half a turn to the right or to the left, keeping themselves horizontal. If the pain is much increased by this half turn, then they are asked to turn the other way until 3 or 4 complete revolutions of the body have been taken. Pain is relieved quickly and is usually recognized as ameliorated after the first turn. Hunter suggests that the method is of diagnostic aid also. If a half turn to the right or to the left increases the pain, we may conclude that some twisting of the intestine with congestion and cramp exists, and that rotation is making the condition worse.

A. B. Johnson³ reported to the New York Surgical Society a successful case of operation for **perforated ulcer of the duodenum**. Four days before admission the man had been in good health and without any disturbance of digestion. He had been suddenly seized with colic above the umbilicus and to the right of the median line. He had no chill and there was no vomiting. The pains were not very violent, but they continued for 2 days and were always referred to the same region. He

¹ Sept. 16, 1899.² Lancet, Aug. 19, 1899.³ Ann. of Surg., Nov., 1899.

had a daily bowel movement and remained at his work. Early in the morning of the day of his admission he was aroused by intense abdominal pains above and to the right of the navel, and a chill came on which lasted half an hour. There was no nausea, but the patient took mustard and water and made himself vomit. He was brought to the hospital in the ambulance at 3 A. M. His abdomen was moderately tender, was rigid, but was not distended. The tenderness was most marked over an area 2 inches in diameter, situated 3 inches above the navel and with its center $1\frac{1}{2}$ inches to the right. A small dose of morphin was given to relieve pain. The abdomen was opened in the right semilunar line. A considerable quantity of cloudy, bile-stained fluid containing coagulated lymph escaped. The vermiform appendix was examined and found to be normal. The incision was extended up to the border of the ribs. Upon the anterior surface of the descending portion of the duodenum, a little to the right and about midway between the junction of the first and second portions, at the point where the second part passes behind the transverse mesocolon, a perforation was seen. A pad of gauze was laid over the ulcer and the abdominal wall was thoroughly irrigated. The opening into the intestine was closed by a purse-string suture, the edges of the ulcer being inverted. Lembert sutures were placed over this purse-string suture. The abdomen was thoroughly flushed without evisceration and the cavity was wiped dry. A strand of gauze was carried down to the site of the ulcer and the remainder of the wound was closed. This patient recovered.

Robert F. Weir¹ discusses elaborately the subject of **perforating duodenal ulcers**, considering the site of such ulcerations, the number and location of ulcers, the frequency of perforation, sex predispositions, causes, frequency, age, progress, symptoms, diagnosis, and treatment. He says that the medicinal treatment is practically the same as the medicinal treatment of gastric ulcers. Rarely is surgical aid sought before perforation, although Codevilla, in 2 cases in which the symptoms pointed to a persistent duodenal ulcer, performed gastro-enterostomy and obtained cure. Occasionally when perforation occurs, death takes place in a few hours. When the diagnosis lies between perforation of the stomach, duodenum, or gall-bladder, an incision should be made by the side of the rectus muscle, reaching not much above the edge of the liver, and extending down a sufficient distance to give free access below the transverse colon; and it is often advisable to add to the upper third of this incision a transverse incision in the skin. This second incision permits cross-cutting of the fascia of the right rectus muscle, which can be pulled aside to permit division of the posterior part of the sheath and the peritoneum. If after opening the abdomen gas or food escapes, the condition is cleared up. This material should be wiped away and the walls of the stomach, duodenum, and gall-bladder should be inspected. If nothing abnormal is detected by this examination, the posterior wall of the stomach should be examined after tearing an opening through the

¹ Tr. Am. Surg. Assoc., 1900, and Med. Rec., May 5, 1900.

gastrocolic omentum, or by lifting up the omentum and the large intestine and entering the lesser omental cavity through the mesocolon, as in the performance of posterior gastro-enterostomy. From the lower end of the abdominal wound the region of the appendix can be explored in many instances, if necessary. If a duodenal ulcer exists, it will usually be found on the anterior duodenal wall, the opening being small and round and the edges being thin. Gas, fluids, or bile may often be seen emerging from the opening. In view of the fact that in some cases extravasated matter has been found to contain castor oil given previous to operation under a mistaken diagnosis of the case, it may be well to administer prior to operation some methyl-blue to aid in finding the opening. When the perforation is discovered, it should be closed by a double or a triple row of interrupted sutures of silk. The ulcer should not be excised before suturing. Excision takes too much time. Weir approves of Pagenstecher's suggestion. This surgeon pointed out that the fundus of a distended gall-bladder is in front of the duodenum. The transverse colon is somewhat in front of and below the horizontal portion of the duodenum, and by raising up and drawing forward the transverse colon the duodenum is exposed. A good view can be obtained of a perforation if the stomach and pylorus are pushed to the left and downward, and if the liver is lifted and the colon is pushed down. After closing the perforation the peritoneum must be carefully cleansed. Any extravasation should be wiped away from the affected portion of the peritoneal cavity, special care being given to the spaces back of the stomach and above the liver, and to the splenic and renal regions. If the condition is localized, after the wiping, gauze drainage is at once inserted. If it is diffuse, the abdomen should be thoroughly irrigated with salt solution. In some cases it may be advisable to make several incisions in order to favor cleansing of the abdominal cavity. Weir reports the 1 case of perforating ulcer of the duodenum in which he operated, a fatal result having followed, and considers the other reported cases—51 in number.

W. W. Keen¹ writes on the **surgical treatment of perforation of the bowel in typhoid fever**. His conclusions are as follows: The moment abdominal symptoms suggest possible perforation the surgeon should be called in consultation. If it is possible to determine the existence of a preperforative stage, an exploratory operation under cocain anesthesia is advisable, this operation being performed before perforation, shock, and sepsis have occurred. After a perforation has occurred an operation should be performed at the earliest possible moment, waiting only until the primary shock, if there be primary shock, has passed away. In a suspected but doubtful perforation the small exploratory incision should be made under cocain, and if there are facilities for making a blood count and an immediate bacteriologic examination, both these proceedings should be carried out. The operation must be done quickly, but must also be done thoroughly; and the profession at large must be awakened to the fact that prompt surgical

¹ Phila. Med. Jour., Nov. 4, 1899.

operation is capable of curing nearly, if not quite, one-third of the cases of perforation.

Harvey Cushing¹ advocates **exploratory laparotomy** under local anesthesia for acute abdominal symptoms occurring in the course of **typhoid fever**, and reports cases of some interest and importance which indicate the value of the procedure. He thinks that in all doubtful cases a prompt exploration, if it could be made without risk, would be very desirable. The question as to the propriety of subjecting a patient to operation is often greatly complicated by the risks of general anesthesia; in fact, not long ago the existence of typhoid infection was considered an absolute contraindication to the use of ether and chloroform. Anesthetic calamities are particularly liable to arise in febrile states, either because of the immediate depressing effect on the disturbed centers or in consequence of the trouble the lungs suffer from after the inhalation. The satisfactory application of local anesthesia in cases of strangulated hernia, in which conditions general anesthesia often produced ill effects, influenced the determination to use local anesthesia in typhoid cases. In performing an abdominal operation under local anesthesia the greatest patience is necessary; it takes more time to operate than if the patient were under ether, and the patient's confidence must be gained beforehand, so that the surgeon may have a moral control over him. The more he uses this method, the less difficulty does he experience; and the more thoroughly familiar he is with the course and distribution of the peripheral nerves, the more likely is he to employ the method successfully. An accidental cutting of an unexpected nerve will often exhaust whatever inhibition toward pain the patient may have originally possessed and render it necessary to give a general anesthetic. When the peritoneal cavity is once opened, gentle handling of the viscera is unaccompanied by pain. This method, when employed in the manner suggested at the Johns Hopkins Hospital, was entirely satisfactory.

Hugh M. Taylor² gives his experience in **operations for typhoid perforation**, and he reports 2 cases—1 successful and 1 unsuccessful. He also maintains that when there is a violent hemorrhage from the bowel during the existence of typhoid, it is proper to open the abdomen and ligate the bleeding vessel and the mesentery, or even to excise the bleeding surface. He is not aware that this has ever been done, and he knows that Keen advises against the operation. He thinks that the cases of hemorrhage should be brought within the scope of surgery, particularly when we reflect that one-fifth of the deaths from typhoid are due to hemorrhage; that is, that we have 10,000 deaths a year from the intestinal hemorrhage of typhoid fever.

M. L. Harris,³ in a very instructive paper, points out the **relations of the colon to intra-abdominal tumors**. "In reaching a conclusion as to the nature of a tumor it must first be determined which organ or tissue it takes origin from. It has been the custom for years to separate

¹ Phila. Med. Jour., Mar. 3, 1900.

² Ann. of Gyn. and Ped., Jan., 1900.

³ Chicago Med. Rec., Aug., 1899.

the abdomen into various regions and to point out which organs or portions of organs occupied each region. Unfortunately, however, many of the organs are movable, normally or pathologically, and hence are not often found in their proper locations; and, again, large tumors are so much displaced by their growth that the region from which they originated can not be defined. We therefore conclude that the division of the abdominal cavity into regions by external lines is often of little value in determining the location of a tumor. What we wish to know is not the relation of the tumor to surface lines, but its relation to the viscera themselves. The colon, owing to its fixed circuitous route and the certainty with which it can be identified, furnishes us with the most satisfactory landmark in determining the location and point of origin of a tumor. "If we take the inner or mesial layer of the longitudinal mesocolon and the inferior or caudal layer of the transverse mesocolon as a dividing line, we subdivide the abdominal cavity into 4 regions or areas: namely, the central region, surrounded by the mesocolon; the superior region, lying above, or cephalad of, the transverse mesocolon; and the right and left posterolateral regions, lying external to and behind the longitudinal mesocolons. While these regions are not at all fixed as regards size and shape, they are quite distinctly fixed in an anatomic sense; and furthermore, as I shall attempt to show, such a subdivision of the abdominal cavity is of considerable value in the diagnosis of intra-abdominal tumors. The boundaries of these several regions as here defined are quite elastic, and a tumor originating in any one of them may by enlargement come to occupy nearly or quite all the abdominal space. This, however, can occur only by a displacement of the boundary, and it is the recognition of this displaced boundary that enables us to refer the origin of these tumors to their respective regions. This boundary itself can not be recognized through the intact abdominal wall, but attached to its free border is the colon, which at all times can be easily outlined, and a displacement of one corresponds to a like displacement of the other. To facilitate the outlining of the colon it should be distended by the insufflation of some harmless gas. The distention of the colon as a means of diagnosis in abdominal tumors is not in itself new, as it has been referred to by numerous writers in a desultory way for many years. Many writers (1) recommend the distention of the stomach and colon with CO_2 and air in the diagnosis of abdominal diseases of these organs, and (Runeborg) in the diagnosis of abdominal tumors, but we have found no attempt at a systematic handling of the subject until Minkowski's article (2) on the combined gaseous distention of the stomach and distention of the colon with water as an aid in the diagnosis of abdominal tumors. He detailed his results in 100 cases of abdominal tumors, and drew the following conclusion: 'An abdominal tumor, on distention of the stomach and colon, usually moves in a direction toward the normal location of the organ from which it takes its origin.' While this is applicable to small movable tumors, it does not obtain in tumors so large as not to admit of displacement nor in fixed or immovable tumors. In these cases the tumor can not be located by

noting the region toward which it is displaced by a colon distended with fluid, but must be located by noting the manner and direction in which the colon itself is displaced or the relation which it bears to the abnormal enlargement. As a means of outlining the colon the insufflation of air or some harmless gas is decidedly preferable to the injection of fluid. Not only is the colon more easily and quickly located by the insufflation of air, but the method is much simpler and easier of application. Besides the annoyance and inconvenience of at times providing for the evacuation of the fluid, many patients are unable to retain sufficient fluid to distend the entire colon without exciting such violent peristalsis as to be painful and thus interfere with a careful examination of the abdomen. Before practising insufflation the colon should be thoroughly emptied and the tumor carefully mapped out upon the surface of the abdomen. For insufflating we make use of the ordinary double rubber bulb of a hand atomizer. To the end of the rubber tubing is fixed a glass or hard rubber tip, which is inserted into the rectum and surrounded by a towel or napkin to prevent the escape of gas. Air is now gently pumped into the colon and almost instantly passes around to the ileocecal valve. As the air rushes in, distending the colon, it can be frequently outlined by the eye throughout its entire course, including the cecum. Should it dip deeply into the loin or be covered by the tumor, its course can easily be followed and outlined by percussion. The relation of the distended colon to the previously outlined area of tumor dullness can now be determined. I have never seen the use of air in this way followed by any bad results. It is usually quickly expelled spontaneously, or should it be retained and produce slight colicky pains, the introduction of a rectal tube is all that is necessary to insure its escape. The diagnostic value of thus determining the relations of the colon to the abdominal tumor may best be shown by referring to actual cases. We will first consider tumors of the central area. Here will be included not only such tumors as actually have their origin within this area, but also such as originate within the pelvis of the female and project into this area. In the list will be found tumors of the omentum and mesentery, solid and cystic; retroperitoneal tumors; lipomata; lymphosarcomata; lymphangiectatic and echinococcus cysts; circumscribed peritoneal exudates; tumors of the small intestine; tumors of displaced or movable kidneys; and all tumors of the female generative organs that rise into the abdominal cavity. It is not to be supposed for a minute that simple distention of the colon is going to differentiate all these tumors, nor is it the intention to present here the various points of differential diagnosis, but a knowledge of the location of the colon may be of considerable aid in the diagnosis of many of them, as will be shown." Harris reports a number of cases to prove the diagnostic value of this method.

Stewart Lewis¹ points out the value of what he calls the **saturation method** in the management of **celiotomy**. He says that in an

¹ Phila. Med. Jour., Dec. 9, 1899.

abdominal section drainage of tissue fluids is necessitated by the administration of the preliminary purgative, by keeping the stomach empty to avoid vomiting, and by loss of blood. This drainage of tissue fluids is an evil, but an inevitable evil, which predisposes the patient to shock, limits absorption, lessens metabolism, and produces many unpleasant symptoms, and it should be combated in every way. The method of combating it he calls the saturation method, and it is part of the system which is used with such excellent results in St. John's Hospital, Brooklyn. In preparing the patient the intestinal canal should be empty and as free from bacteria as possible. The tissues should be fluid-saturated to the physiologic limit, the patient being in this condition when shock and hemorrhage are expected. This is better than rushing to produce these conditions when shock and hemorrhage have occurred. Theoretically, it might be supposed to favor hemorrhage; practically, it does not do so. "(A) Failure in this point may result (1) in annoyance to the operator by the distended intestines; (2) in post-operative flatulence, painful and even dangerous; (3) in intestinal toxemia, which predisposes to vomiting, nephritis, and suppuration, and may even be directly fatal. We find that by limiting the diet to that which will produce the minimum of either gas or toxins, by several mild purgations instead of one imperfect or excessive and exhausting evacuation, and by the use of intestinal antiseptics, 3 or 4 times daily, these factors may be absolutely eliminated, the bowel at time of operation being almost flat. The final cleansing is a matter of vital importance. Eighteen hours previous to operation 2 or 3 grains of calomel are given in single or divided doses and combined with some cholagogue, such as the ordinary a. b. s. pill, as an antidote to the depressing effect of calomel on the liver. Six hours previously 4 quarts of normal saline by enema should be given in Sims' position, very slowly and with especial care to insure long retention. The usual saline cathartic is omitted. (B) Observe that the preceding method is not only thorough, but that the tissue fluids are not drained by the usual saline cathartic, but are reinforced by the saline enema. For 48 hours preceding, copious drafts of water, 6 to 8 ounces every 2 hours, are administered. After operation comes in the process of restitution: (1) Each patient, while still narcotized, is given a quart of saline by enema. This is best given while the patient is still on the operating table, as the half-conscious patient is certain to expel it. In the presence of shock, of deficient renal elimination, or of toxemia, these enemas are repeated, sometimes even hourly, and with great care to insure retention. (2) As soon as ether-vomiting has ceased the administration of hot water is begun. This must be in quantities sufficient to reach the stomach hot, not in teaspoonful doses, to arrive lukewarm and be promptly vomited. The good effects of this treatment are shown in the greatly better *morale* of the patient. Shock is greatly lessened. Headache, excessive thirst, and wiry pulse are rare. The urine is increased in quantity and its specific gravity is much lessened. The irritable bladder is unknown and postoperative nephritis almost so. I

was first led to study this subject by observation of the effects of the routine use of postoperative saline enemas in the services of Dr. Hopkins, at St. John's Hospital. In the use of this method enthusiasm has increased with experience."

F. De Quervain¹ is a believer in the use of the **purse-string suture in closing the peritoneum** in all celiotomy wounds which permit its application. This purse-string suture in closing the peritoneum restricts the exposed area so that there is less liability of the bowel or omentum becoming attached to it, and when ordinary sutures are used, the probability of such attachment to the suture line is great. He uses two forms of purse-string suture: one sutures the serous surface inward, as in closing the bowel or gall-bladder or the urinary bladder; the other is used in closing the peritoneum in laparotomy. If a purse-string suture is to be used to close the peritoneum after laparotomy, the wound must not be over 10 cm. in length, and the peritoneum must be to some extent movable—a condition such as we find in the epigastric region of a patient who is much emaciated. Four clamps are applied to the edges of the peritoneum. A curved needle is used to insert the suture. When the suture has been introduced, the ends are pulled upon until the opening is closed. The remaining portion of the abdominal incision is closed in the usual manner. [O'Hara² suggests a like method.]

Robert F. Weir³ discusses the formation of an **artificial anus**. He considers the method of performance and the value of the various plans which have been suggested. He concludes that a temporary artificial anus can be best made by Maydl's method or by Bodine's modification; that the slipping of feces from the upper or the lower end may be prevented by making a proper spur; by narrowing the opening toward the rectum or by absolutely closing the end toward the rectum, which may then be sutured to the wound or dropped into the abdominal cavity. He considers that the power to retain feces at the abnormal anus is aided by the performance of the muscular separation of Maydl, by the muscular projection of Von Hacker and Hartmann, or by the employment of plugs or some such apparatus. But continence, to be satisfactory, can be effected only by giving the bowel an extra-abdominal iliac outlet; for instance, by the performance of Witzel's iliac colostomy, the bowel being bent outside of and behind the iliac spine. In this operation the bowel is compressed between the skin and the edge of the pelvis. Some surgeons, however, make the orifice external, bringing the bowel through an opening in the iliac bone. Weir says that he has performed the operation for the formation of an artificial anus 30 times with 9 deaths. Sixteen of these cases were for malignant disease, 9 were for chronic ulceration, and 5 were for intestinal obstruction.

Kocher⁴ describes **anemia necrosis of the intestine**, and says that operations on the gastro-intestinal canal are attended with this danger, which surgeons previously have not suspected. By anemia

¹ Ann. of Surg., Nov., 1899.

² Med. Rec., April 21, 1900.

³ Brit. Med. Jour., June 10, 1899.

⁴ Deut. med. Woch., Sept. 14, 1899.

necrosis he means necrosis of the mucous membrane of the intestine produced by circulatory disturbances resulting from injury to the mesenteric vessels. He reports the case of a cancer of the stomach. The stomach was adherent to the spleen and to the transverse colon. Kocher removed in one piece the stomach and the part of the colon to which the cancer was attached. When he lifted up the separated portion of the colon, he discovered that the mesocolon was adherent to the pancreas. It was difficult to separate it, and he had to tie several vessels; it was necessary to separate the stomach from the spleen in the same way. The duodenum was sutured to the esophagus and the cut ends of the colon were sewed together. The patient died on the fourth day with evidences of peritonitis, but on postmortem examination it was found that there was no peritonitis, but that the portions of the intestines which lay in the pelvis were inflamed and covered with fibrinous masses. The inflamed portion of the intestine was about 6 feet above the ileocecal valve, and when it was opened, a mass of mucous membrane was found to be necrosed. No thrombosis of the mesenteric vessels could be detected. The conclusion of Kocher was that the traction and manipulation, lasting, as it did, for 3 hours during the operation, interrupted the circulation so long that necrosis followed. Kocher thinks that such a case as this proves that the incision in the abdominal wall ought to be sufficiently long to enable the surgeon to avoid making pressure on the vessels when he lifts organs out of the abdomen to examine them or to operate upon them. He thinks it proves that the mesenteric vessels ought to be handled as little as possible, and that he should hesitate to employ gauze pads within the abdomen.

Le Dentu¹ writes on **exclusion of the intestine**. By this operation a portion of the intestine is entirely separated. It is cut through above and below the lesion and each cut end is sutured; the divided ends of the gut above and below the separated loop being brought together by enterorrhaphy. Under certain conditions this operation is advisable rather than the making of an artificial anus. The treatment of the excluded portion varies with different surgeons. Von Eiselberg sutures both ends of this portion to the skin, and this permits the escape of any material gathered in the loop. Some fasten only the distal end or only the proximal end to the external wound, closing the other end and dropping it back into the cavity of the abdomen. Sometimes each end is closed and an opening is made into the middle of the isolated portion for drainage, or the fistula which already exists is relied on for drainage. Some operators suture both ends, drop them back, and make no drainage, or else suture the two ends together so as to convert the loop of intestine into a ring. This is really the better method, and it takes only one line of sutures. Le Dentu thinks, however, that it is much safer to fasten both ends to the skin, if this can be done; but if this can not be carried out, to suture one end to the skin, so that there is drainage of the loop. The operation of exclusion is usually per-

¹ Rev. de Gyn. et de Chir. Abdom., Jan. and Feb., 1899.

formed on the large intestine, but Von Eiselberg has succeeded in excluding over a yard of the ileum, and in another case he excluded 20 inches of ileum, together with the cecum, the ascending colon, and about half of the transverse colon. Von Eiselberg's statistics show 12 operations with 2 deaths, both deaths being in cases of obstruction. An intestinal exclusion is not a proper operation for obstruction. It is used in some cases of neoplasm of the intestine, in inflammatory conditions of the intestine, and in fistulæ.

Van Baracz,¹ in speaking of the dangers of total exclusion, maintains that it is dangerous and improper to close both ends of the isolated loop. The operation previously has usually been carried out in cases of chronic obstruction in which firm adhesions made it impossible to resect the diseased area of gut. A portion of the intestine which has been excluded is liable eventually to become distended with fecal matter and various secretions. Because of the virulent bacteria which gather, the overdistention of the excluded loop, and the adhesions to various organs, the intestinal wall is likely to become inflamed, and even to ulcerate through, and as the isolated intestine is in a condition of depressed physiologic power, its vital resistance to any infective organism is lowered. The surgeon should guard against these dangers by making a permanent fistula into the excluded portion of the intestine.

F. T. Paul² writes on **colectomy**. In 1895 he published 7 cases. The experience in these cases leads him to advise operation involving the establishment of a temporary or permanent artificial anus in preference to any other method employed for immediately restoring the continuity of the bowel. The operation is performed as follows: A free incision is made over the area of trouble; the bowel is exposed, the mesentery being clamped or the vessels ligated, and is freely divided on

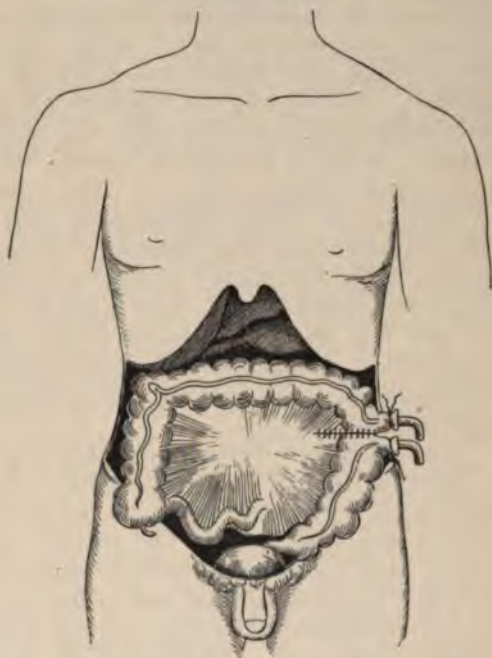


Fig. 11.—Paul's method of colectomy (*Liverpool Med.-Chir. Jour.*, Feb., 1900).

¹ *Arch. f. klin. Chir.*, Bd. LVIII, Heft 1.

² *Liverpool Med.-Chir. Jour.*, Feb., 1900.

each side well beyond the growth. This permits the loosened portion of the bowel with the tumor to hang easily out of the abdominal wound. The mesentery is sutured together in the opposite direction, leaving the cut stump on the under side, and the sutures are passed into the outer coats of the upper and lower portions of the loosened bowel in such a way as to cause the portions of the bowel to lie in contact for at least 3 inches, like the two barrels of a double-barreled gun. Small incisions are made in the gut above and below the growth. Through the upper a large colotomy tube is introduced and fastened with a ligature; through the lower a smaller tube is passed. The loop of bowel containing the tumor is cut away—a proceeding which is bloodless because of the previous division of the mesentery and the ligature around the bowel. It is not necessary to suture the bowel to the wound. The ends of the wound may be closed with sutures passed through all the layers of the abdominal wall. All the stages in this operation after opening the belly cavity are bloodless, and there is no risk of infecting the peritoneum with fecal matter. Hence, if the growth is small, this operation is but little more serious than ordinary colotomy. The tubes remain in place from 7 to 10 days. After their separation, as soon as the wound is cleaned, in every suitable case long dressing forceps with the handles fastened together with fine rubber tubing are employed after the method of Dupuytren's enterotome. After a few days the forceps will cut through the spur and restore the lumen of the bowel. When this has been accomplished, the artificial anus is easily closed by separating the mucous membrane, turning it in with Lembert's sutures, and bringing the skin edges together above it.

Carl Schlatter¹ discusses the process of **digestion after resection of about 6 feet of small intestine**. The operation had been rendered necessary by stab wounds in the belly. The resected portion was entirely from the ileum. The patient recovered without bad results. A little over 3 weeks subsequent to the operation the patient was feeling well and was on a full diet, and in less than 2 months after the operation he was discharged looking well and with a good appetite and having usually a daily stool. Elaborate study was made of the changes which took place in the digestion of food. Eight months after the operation this patient was found to be in fairly good condition. He could do some work, but he worked slowly. He had become unable to tolerate solid food. He weighed at this time 158 pounds, a loss of 7 pounds since his discharge from the hospital, at which time he had weighed 165 pounds. This patient can get along only by taking a considerable quantity of food and leading a quiet easy life. [Grybicky believes that an adult can get along even after the removal of 9½ feet of intestine. Jacob R. Johns,² of Philadelphia, who removed 2½ feet successfully, publishes the following list of cases adapted from Shepherd's table:³

¹ *Lancet*, Jan. 27, 1900.

² *Med. News*, Jan. 19, 1895; *Med. News*, Dec. 2, 1899.

³ *Montreal Med. Jour.*, Dec., 1897.

OPERATOR.	TOTAL LOSS.	NATURE OF LESION.	TIME AFTER WHICH HEALTH WAS STILL FAIR.
1. Ruggi	130 inches	Multiple stricture	2 years
2. Shepherd	92 "	Tumor of mesentery	7 months
3. Kocher	82 "	Railway injury	6 "
4. Koeberle	73½ "	Multiple stricture	6 "
5. Kocher	63 "	Strangulated hernia	6 "
6. Schlange	53 "	Strangulated hernia	2 years
7. Eliot	48½ "	Gangrene of intestine	2 "
8. Roux	48½ "	Tumor of mesentery	6 months
9. Trombetta	43½ "	(Not stated)	6 "
10. Werder	42 "	Tumor of mesentery	6 "
11. Hahn	31½ "	(Not stated)	6 "
12. Beaver	30 "	Strangulated hernia	5 years.

Kukula has reported a case in which a portion 12 feet long was removed, but the patient died. Recovery followed in a case from which a piece 11 feet in length was removed. He believes that a great part of the large intestine may be removed. See *Archiv für klin. Chir.*, vol. LXVI.]

H. W. Cushing¹ prefers the right-angled continuous intestinal suture (Figs. 12-18, p. 104), maintaining that it can be applied with ease and rapidity. It saves the time of tying 20 or 30 knots, which has to be done in the interrupted suture, and an intestinal wound can be closed from one-third to one-half more rapidly with the continuous suture than with any other form. It brings about a neat and accurate union of the wound. It is not only a continuous suture, but is also a buried suture, and thus reduces adhesive inflammation to a minimum. Its technic is not so easily learned as that of the ordinary Lembert suture. It has been claimed that if there is much intestinal distention, constriction occurs, which results in obstruction to circulation of blood; but Cushing has found no record of such a result. The fact is that the constricting circle is an advantage, because it is buried and there is more extensive inversion of serous surfaces. With the Lembert suture the sutures separate as the intestines distend and its circumference increases, and by this distention the inverted area becomes narrower and may be everted and prolapsed outward by the sutures. He knows of no case of septic infection and suppuration in the track of the suture when the suture was being cast off into the intestine. For this suture he uses the finest white silk machine twist, sterilized by boiling, preserved in sublimated ($\frac{1}{100}$ %) alcohol (95%). The best needle is the "self-threading" or "spring-eyed" round sewing needle, $1\frac{1}{8}$ inches long, ground flat like a Hagedorn needle.

J. W. Hartigan² describes a new method of intestinal anastomosis, end-to-end anastomosis being effected by the aid of light rings of large lumen. The rings used were of selenite, and of the sort used in the laboratory for making ring microscopic preparations. Bone, rubber, or aluminium does just as well. The surfaces which face have eminences and depressions to prevent circular movements when *in situ*,

¹ Boston M. and S. Jour., July 20, 1899.

² N. Y. Med. Jour., July 15, 1899.



Fig. 12.

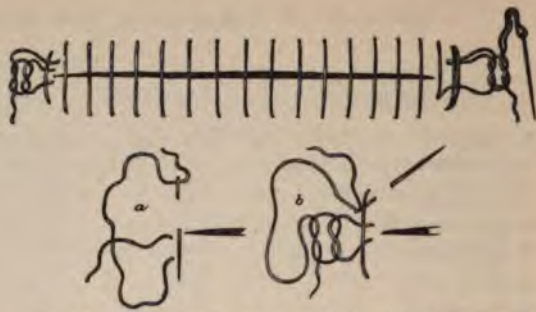


Fig. 13.—Diagrammatic. Actual size, as in human ileum, peritoneal surface: *a-b*, Plan of suture at commencement of insertion.



Fig. 14.—Ileum, peritoneal surface: *a*, Suture in various stages of its formation (notice the direction of the needle, inserted parallel to the wound instead of at a right angle to it, as in the Lembert and many other sutures); *b*, the completed suture, no knot or suture visible.



Fig. 15.

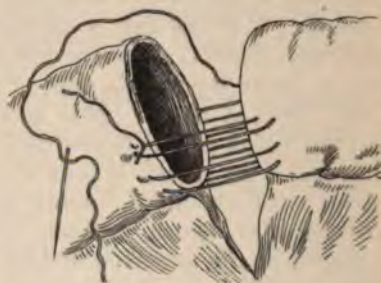


Fig. 16.



Fig. 17.



Fig. 18.

Cushing's "right-angled" continuous intestinal suture (Boston M. and S. Jour., July 20, 1899).

but they may be left smooth. The surfaces which face the lumen and the surfaces opposite to those holding the peritoneal surfaces in contact may be grooved if absorbable rings are used. The grooves which hold the sutures when introduced so weaken the rings that they will eventually break into small pieces. The length of time they will endure depends upon the substance of which they are made and the depth of the grooves.

James H. Nicoll¹ is an advocate of **enterorrhaphy without mechanical aids** in most instances, although he quite recognizes that certain cases exist in which the Murphy button is the least risky mode of operation. He believes, however, that in almost all cases accurate suture gives better results. There is a great difference of opinion upon this point. He believes that this difference of opinion may be because of the fact that cases in which intestinal operations are performed are of two distinct and different classes, and that in contrasting results of operative methods these classes are not always differentiated by writers. The two classes which require operation are, first, cases in which the gastro-intestinal tract is gorged—that is, cases of acute intestinal obstruction; and, second, those in which the gastro-intestinal tract has been purposely emptied beforehand—that is, cases of chronic intestinal affection. The experimental observations with the use of clamping buttons have been made on healthy animals with healthy intestines, and when the surgeon has come to operate under like conditions in the human being, the results are comparable, as shown by the records of operations of gastro-enterostomy or of intestinal resection for carcinoma. In such cases the patient is not acutely ill and the gastro-intestinal tract has been carefully prepared for operation. When the button has been used for resection in cases of acute intestinal obstruction, the mortality has been extremely high. In such cases the individual is toxemic from autoinfection, and the condition can be relieved only by speedy evacuation. The intestine above the site of obstruction is filled with contents,—solid and fluid,—and pints of this material may have to pass the line of union. Returning peristalsis forces these contents on the line of union, and if that is maintained by a large button with a small lumen, bad results not unusually follow. Among these results are obstruction of the lumen by solid masses, intussusception, and dislodgment of the button with a consequent escape of the imprisoned intestinal margins. In experimental operations the intestine of the animal is so thin that it is exceedingly difficult to insert sutures which do not penetrate between the coats. Under these conditions it is only to be expected that the button operation will show better results than the simple suture. In man, however, the intestinal coats are sufficiently thick to make the introduction of sutures comparatively easy even in a normal intestine, and it is still more easy in a congested and thickened intestine. The claim of speed may be justly advanced in favor of the button; but if the case is one of acute intestinal obstruction, the gain in time is at the cost of the risks just pointed out. Surgeons will admit, however, that there are cases

¹ Brit. Med. Jour., Oct. 21, 1899.

in which speed is the first consideration, and in a patient who is utterly collapsed or in a patient operated on by an unskilled operator, the button, in spite of its risks, may enable the surgeon to complete the operation while the patient lives. In the hands of a skilled operator, especially if a continuous suture is used, the time required is not much greater than that required to apply the button; and if the button is reinforced by a line of suture over it, it will take every bit as long as will simple enterorrhaphy. In performing circular enterorrhaphy Nicoll uses for the most part the Czerny-Lembert suture, employing it by the continuous method. In some cases—namely, those in which the



Fig. 19.—McLean's anastomosis forceps
(Phila. Med. Jour., Oct. 21, 1899).



Fig. 20.—McLean's anastomosis forceps:
Separate blades showing the inner surfaces
with rings in position (Phila. Med. Jour.,
Oct. 21, 1899).

intestinal coats are much congested and thickened, and in which there is a considerable fecal mass above the lesion—he employs another method of circular enterorrhaphy. He removes a ring of mucous membrane from the distal end, into which end the proximal portion is passed and there secured by a looping of a continuous suture.

Walter Edmunds and Ewen C. Stabb¹ report **experiments in intestinal suturing**. Seven dogs in which after complete division the intestine was reunited by the aid of Halsted's cylinders recovered. Of the 7 operated on by the Murphy button, 5 recovered; and of the 7 operated on by Laplace's forceps, only 4 recovered; the failures were

¹ Lancet, April 14, 1900.

all due to nonunion. These experiments are in favor of Halsted's inflated rubber cylinders. The inflated cylinder pushes back the mucous membrane, which otherwise everts itself so as to interfere with the suturing of the outer coats. The cylinder prevents the escape of the intestinal contents and thus renders clamps unnecessary. Murphy's button is not trustworthy unless external sutures are applied, and if this is done, the time of operation is considerably lengthened. Animals do not recover so quickly after the use of the Murphy button as after the



Fig. 21.—Halsted's suture, showing the weak points (*Jour. Am. Med. Assoc.*, Jan. 27, 1900).

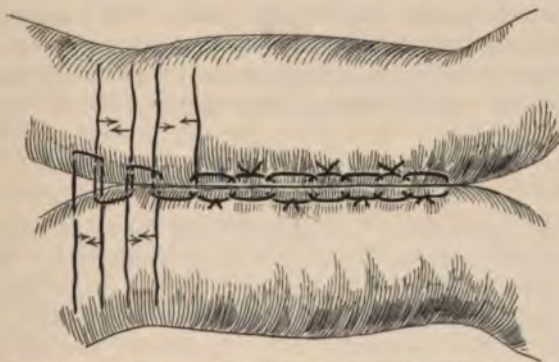


Fig. 22.—Halsted's suture as modified by R. C. Turck (*Jour. Am. Med. Assoc.*, Jan. 27, 1900).

use of Halsted's cylinders. After Halsted's operation the animals passed formed stools the next day. After the use of the Murphy button, only liquid stools were passed for 2 or 3 days. They do not like Laplace's forceps, not thinking that the instrument affords any real aid to suturing. With regard to human surgery, the difference in the thickness of the muscular coats in the intestines of dogs and man does not invalidate the conclusions.

A. J. Downes¹ writes an article on the **anastomosis forceps** (Fig. 19) which he employs. He has illustrated the worth of the forceps and

¹ *Phila. Med. Jour.*, Dec. 16, 1899.

has given them a better spring and a locking catch. He says it has other uses besides that for which it was originally devised. It is a good sponge holder, a useful sized forceps and tongue tractor, and a serviceable hemostatic forceps for broad oozing surfaces. He considers it immeasurably superior to the compound anastomosis forceps.

Angus McLean¹ advocates the use of forceps of his devising (Fig. 20, p. 106) in the performance of intestinal anastomosis. The instrument is constructed on the principle of the obstetric forceps, with a series of incomplete rings for the clamping portion, there being several different sizes of rings, which can be adjusted according to the needs of the case.

R. C. Turck² advocates the use of a **modified Halsted suture** in performing **enterorrhaphy**. When the knots are tied on the Halsted suture, the suture makes traction longitudinally, thus approximating the wound surfaces, but at the same time makes a lateral pull drawing the sutures away from each other and leaving weak points in the suture line, as is shown in figure 21. This can be avoided by placing the sutures very close together, which, of course, occupies considerable time; or it can be avoided by modifying the suture as shown in figure 22.

Jonathan Hutchinson, Jr.,³ read a paper on **resection of gangrenous intestine** in hernia cases. He said it was the general opinion of surgeons that the use of the Murphy button had rendered the operation more rapid and safer. He collected 15 examples of primary resection for gangrenous intestine in which the Murphy button was used and 16 cases in which simple sutures were used. But 1 case recovered in which the Murphy button was used and 6 cases recovered after simple suturing. Postmortem examinations showed that the divided ends were united better after simple suturing than after the use of the button.

APPENDICITIS.

Maurice H. Richardson⁴ has contributed one of the most important articles of recent years on the subject of **appendicitis**. He takes up for discussion two questions: (1) Should every case be operated on as soon as the diagnosis is made? (2) Should the appendix be removed in every case? The questions to be considered are all surgical, for appendicitis is a surgical disease. From month to month and year to year his opinions have changed. The series of 19 consecutive deaths after operation in acute appendicitis—and such an experience has occurred, it is said—suggests the query, Is it not better to abandon a hard-and-fast rule to operate in every case, and to follow rather a policy of discrimination and selection? It may be said that such an experience renders it more than ever imperative that every case should be operated on as soon as the diagnosis is made; but to this should be added the qualification, when the diagnosis is made early. Some physicians state that they have had no case die under palliative treatment, and hence an

¹ Phila. Med. Jour., Oct. 21, 1899.

² Medicine, Mar., 1900.

³ Phila. Med. Jour., Feb. 17, 1900.

⁴ Trans. Am. Surg. Assoc., 1899, and Am. Jour. Med. Sci., Dec., 1899.

operation is never necessary. Richardson's experience has never ranged between such entire success and complete failure. But he admits that a series of severe cases in which there was a large mortality after comparatively early operation has caused him to doubt the wisdom of operating in every case. A large percentage of recoveries in several cases in which, for some reason, no operation was performed added to the doubt. When after a large experience the surgeon is persuaded that in some cases the operation is the last straw, then it seems possibly unwise to follow an invariable rule of procedure, and there may be other courses open worth considering. The question would be much more easily solved if every case recovered after operation. There is a time for operation when practically all will recover. There is also a time when many will die. Hence there is a period when an unwise operation and a period when an unwise palliation may be fatal. In many cases the choice of the method will influence for good or evil the result. If in every case we operate as soon as the diagnosis is made, we may happen to operate at the very time when the patient's best chance remains in conservatism. In discussing appendicitis we speak of cases which are pictured in words, not cases which we all observe at the same time at the bedside. What one speaks of as a severe case, another may refer to as a mild one; what one regards as hopeless, another may consider merely serious; what one maintains is general peritonitis, another claims is a simple serous exudate. We must bear in mind that in using such terms as severity, urgency, and hopelessness, we may not be speaking of exactly the same conditions; and that while we may differ in a discussion, at the bedside we might be in entire agreement. When operations were first undertaken for appendicitis the mortality was excessive. When operations were performed earlier, it was found that the mortality diminished, and it has been shown that practically all operations succeed if performed before the peritoneum becomes infected. When the infectious process has reached the peritoneum, the prognosis in many cases is better under palliative than under operative treatment. We should also bear in mind that the interval operation possesses advantages which justify the risk of waiting in certain cases. The question whether we shall operate as soon as the diagnosis is made, depends upon the period of the disease. The diagnosis may have been made during the first or second or third day, or a day later. Very early, means in the first 24 hours. If a hard-and-fast rule is ever followed, it should be at this time. If the diagnosis of appendicitis is made thus early, the operation is much safer than it would be a day or two later; but, unfortunately, a positive diagnosis can not always be made at this time, because many acute abdominal lesions begin in exactly the same way. Perforation of the stomach, acute inflammation of the gall-bladder, acute inflammation of the pancreas, thrombosis or embolism of the mesenteric vessels, extravasation from the intestine, acute salpingitis, ovarian tumor with twisted pedicle, acute intestinal obstruction, rupture of an abscess or an extra-uterine pregnancy, congenital malformation of the intestine—any one of these may suggest appendicitis. So may

acute gastro-intestinal catarrh, ptomain poisoning, cholera morbus, and lead colic. Operation is usually advisable as soon as the diagnosis is made in severe cases of acute appendicitis accompanied by the symptoms of peritoneal invasion. Exploratory operation is demanded if there are evidences of peritoneal infection, even if the diagnosis of appendicitis is not made; but the opening of the abdomen at the beginning of appendicitis of mild type seems questionable, even if the diagnosis is made reasonably clear, because the disease is often so mild and its manifestations so slight that intervention can be justified only on the claim that a trivial attack is likely to become suddenly severe—an event which, in Richardson's experience, is extremely improbable.

Under the heading "**mild attacks**" belong cases in which there is pain unaccompanied by nausea, vomiting, rigidity, or fever. These attacks subside very rapidly and require operation only when they recur so frequently as to produce disability. They are appendicular colics rather than true infections. The removal of the appendix in such a case is not in reality a grave matter, because practically all cases will recover if it is removed; but the lesion is not grave enough to justify even so safe a procedure as abdominal section unless there are repeated recurrences. Of course, cases might be cited here to show the difficulties which arise in attempting to solve these questions—cases which apparently demanded operation, but in which operation proved unnecessary; cases treated by medicinal means which ought to have been operated on; and cases justifying operation that recovered rapidly without. Yet Richardson says that he has rarely performed an unnecessary operation. In but 1 case in which he performed an unnecessary operation did death follow. No cases occurred in which death followed delay except certain desperate cases, to be considered later, in which the condition was so bad that the patient did not seem to have the least hope of recovering except by the unaided efforts of nature. Some years ago Richardson stated that the first symptoms of acute appendicitis were due to extravasation from the appendix, an infection either extensive and rapid from the giving-way of the wall of the appendix, or gradually from an invasion of the peritoneum by diffusion, the result being either a localized or a spreading peritonitis. His experience in recent years has confirmed this view. In a case of a severe type beginning violently there is always a perforated appendix or a localized infection. Early intervention in the trivial cases would doubtless show an infection limited to the interior of the appendix and permitting the immediate closure of the wound. If any rule is laid down, it should be that in the very beginning of the disease severe cases require operation, because there is always perforation, gangrene, or peri-appendicial infection. Mild cases justify early operation because there is little danger in the operation and because the wound can be closed; but the mild cases will recover whether operated upon or not, so the benefits of operation apply only to the severe cases. Unfortunately, the surgeon often sees the case for the first time on the second, third, or fourth day, at a time when the propriety of invariable operation is open to serious question.

After the first 24 hours of an attack an operation should be performed if the symptoms are severe, and especially if they are increasing in intensity. At this period, if the symptoms are as severe as in the start of the trouble, it may be concluded that almost always there has been an escape of infectious matter from the appendix, and that there is at least a local peritonitis. If operation is performed, the surgeon will find a small appendix, changed in consistence, altered in color, with areas of local necrosis or even completely necrotic. The contiguous structures will be covered by an exudate and will be adherent to each other by easily separated adhesions. There may be some feeble barriers against speedy infection, but every operation at this stage of necessity involves the peritoneal cavity. There may be an actual opening into the appendix even now, through which intestinal or appendicial contents escape. On the other hand, the appendix may be perfectly intact, even when there are severe symptoms, the symptoms depending upon absorption from the interior of the appendix; but such a condition is rare. The peritoneal cavity at the time always contains free fluid—sometimes clear, sometimes turbid, sometimes foul. If this fluid is sterile, it is an excellent culture-medium, and must be infected in all operations upon a gangrenous or perforated appendix. In spite of this danger, operation should be performed, as a rule, even on the second day, if the symptoms are more severe, especially if they are increasing in severity, because these fluids are likely to become contaminated in spite of the efforts of nature to localize the infection. The symptoms at this time are regarded as severe if pain continues unabated, and if there is fever, tenderness in the right iliac fossa, and right-sided rigidity. The symptoms are looked upon as being especially severe if there is vomiting and distention. The constitutional signs are not so important as the local. In some severe infections the pulse and temperature are but slightly affected. If constitutional symptoms are far more marked than the local symptoms, the surgeon should carefully consider the diagnosis, for constitutional symptoms may be due to an acute absorption from the gastrointestinal tract, the local signs being produced by a painful colic of the right side of the abdomen; but pain which has made its way to the appendicial region, which remains there, and is accompanied by marked muscular rigidity and tenderness, even if there is no fever, should excite apprehension, and cause the surgeon to take into consideration the question of operation. With tumor and with fever these symptoms call for operation, unless there is a rapid and positive amelioration. They call for it, if there is constant vomiting and beginning distention, even if some symptoms show signs of improvement. One is seldom wrong in operating in severe cases, at this time. The barriers against the spreading of the infection are not to be relied on. In a doubtful case the blood should be counted, and if leukocytosis exists, it may add the necessary evidence deciding us in favor of operation.

Richardson then analyzes the value of the various symptoms observed in appendicitis. He says when the surgeon sees the case for the first time on the second, third, fourth, or fifth day, its general trend may be deter-

mined with more or less accuracy. There is peritoneal infection or there is not; disaster is impending or it is not; the patient is markedly improved or he is not any better. We should question a rule of procedure which at this time requires in every case the same line of treatment. Some of these cases will recover without operation. Some die with it, and by applying a universal rule we may turn the scale against the patient who would have recovered by other methods of treatment. Richardson is positively convinced, that at times, by operating we do turn the scale against the patient, and it is really true that by not operating we may at times withhold his only chance. At this critical period, intelligent discrimination is necessary. Each case is a case by itself, and no general rule of procedure should be advocated. When we operate after the first 48 hours, the conditions found differ from those discovered when we operate in the early hours. Necrosis has been fully established, or localization has become successful, or infection has become general. The appendix will be found embedded in fresh adhesions, and around it at some spot will be discovered a foul-smelling liquid exudate, filled with bacteria. This liquid area may be to the right, behind the cecum; may be high up, involving the liver and kidney; may fill the pelvis or cover the bladder; may be among the small intestines; may be directly under the skin; or may be partly in the left lower quadrant of the abdomen. The peritoneal cavity will often be found filled with sterile serum, separated positively from the focus of infection, but in other cases, unfortunately, it will be found extensively infected. The appendix will show all varieties of necrosis. There is usually, but not always, a perforation. Unfortunately, in the dangerous days of appendicitis—the third, the fourth, or the fifth, or even later—the result of operation may be fatal. The question comes up, Can we tide the patient over these critical days to a time when intervention is almost certainly successful, when the danger will be that of simply draining an abscess or of an interval operation? Is it not wise, when the case is severe and of a type usually fatal after operation, when general peritonitis does not exist, and when there are signs of improvement, to wait for a more favorable time for operation? Richardson considers that the answer to this question must be in the affirmative. Although central localization of septic fluid about a presumably gangrenous appendix can not be interfered with in these early days of appendicitis without grave danger of causing general peritonitis, this danger, great though it be, must be encountered if the symptoms are becoming more severe, particularly if there is any evidence that a sudden extension has taken place; if the patient is in a dangerously septic condition, as shown by pulse, temperature, and circulation; and if, though there is no increase in symptoms, they are still severe, should the symptoms show signs of improvement, surgical intervention in this dangerous class of cases should be postponed. Richardson's opinion is based upon the large mortality following operation. Another class of cases includes those in which the chances are balanced; the slightest radical treatment being sufficient to turn the scale unfavorably. Some-

times these cases may recover, either with operation or without, although they usually die. It seems clear that such patients are usually better treated medicinally when it is reasonably evident that the slightest shock will turn the scale against them. The principle is the same as when there is shock from a severe injury, although in the shock of peritoneal absorption reaction is far less likely to occur than in traumatic shock. The initial signs of peritoneal contamination differ from those of fully developed toxemia. The shock of invasion is sudden and severe and chiefly affects the pulse, and the temperature may be depressed. In fully developed toxemia the signs are those of approaching death—lividity, cold extremities, high pulse, and high temperature. It is very difficult to settle the question of invasion in cases of severity. It would be much easier to apply a hard-and-fast rule, but Richardson can not subscribe to an invariable rule of procedure at any stage of appendicitis. Richardson's conclusions are summed up as follows: "(I) Should every case be operated upon as soon as the diagnosis is made? As a rule, the appendix should be removed if the diagnosis is made in the first hours of the attack. After the early hours operation, is advisable: (1) If the symptoms are severe, and especially if they are increasing in severity; (2) if the symptoms, after a marked improvement, recur; (3) if the symptoms, though moderate, do not improve. The wisdom of the operation is questionable: (1) In severe cases in which an extensive peritonitis is successfully localized and the patient is improving; (1) in cases which are at a critical stage, and which can not successfully undergo the slightest shock. (II) Should the appendix be removed in every case? It should not be removed: (1) In localized abscesses with firm walls; (2) when the patient's strength does not permit prolonged search. It should be removed whenever the peritoneal cavity is opened, unless the patient's condition forbids. The appendix should be removed in all cases as soon as the inflammatory process has had time completely to subside—in from 2 to 3 months after the attack. In cases simply drained, the scar tissue should be excised, the appendix removed, and the wound securely sutured."

C. B. Keetley¹ describes a **mode of operating** in cases of appendicitis. He believes that this method is proper whether on the first or last day of an acute, a subacute, or a chronic attack, although he does not say that it is indicated at all times and in all cases. The method takes into consideration the path by which pus, if pus forms, usually rises to the inguinal region of the abdominal wall, and remains as often as possible outside the peritoneal cavity. The surgeon begins as if he wished to ligate the common iliac artery by an extraperitoneal operation. An incision is made above the anterior superior iliac spine and the outer half of Poupart's ligament, parallel to the ligament. After incising the transversalis fascia, the peritoneum is separated from the iliac fascia, the surgeon at this time palpating for the deep surface of the appendix or for inflammatory thickening about it. A strong light is reflected into the wound and evidences of inflammation or pus forma-

¹ *Lancet*, Jan. 13, 1900.

tion are looked for. If pus is found, the infiltrated tissue is torn open carefully with two pairs of dissecting forceps. Whether pus is found or not, 2 medium-sized drainage-tubes are carried to the depth of the wound. If pus is found, it should be swabbed out gently, and neither the douche nor the syringe should be used. If in separating the peritoneum it should be torn, the opening is used for the purpose of exploration, and is then closed with a suture and protected with a fold of iodoform gauze wrung out in a warm solution of corrosive sublimate. If the appendix is in its usual position, behind and beneath the cecum, or if the cecum is abnormally placed, indications of this may be found before the skin is cut. If the cecum and appendix are high up toward the iliac crest, the peritoneal incision may be extended upward, and finally a lumbar incision may be made for drainage, which may still be kept extraperitoneal. If the appendix is unusually near or internal to the brim of the pelvis, it may be possible to reach it by directing the deep dissection inward toward the pelvic brim. If in spite of inflammatory thickening the appendix floats free in the peritoneal cavity, and if the peritoneum shows no sign of infection, there is no reason why the appendix should not be excised. If it is the center of adhesions possibly bounding pus, and the thickened mass floats comparatively free in the abdominal cavity, then, if it can be done without tension, bring the inflamed mass and fix it by sutures through healthy tissue to some part of the peritoneal wound and leave that part of the wound open. If this course can not be pursued without dragging on the bowel, carry the drain down to the inflammatory mass or let it alone altogether. Do not tear open adhesions and remove the appendix if the patient is in the midst of an acute or a subacute attack, but wait until the temperature is normal or nearly normal, watching the patient narrowly, giving no opium, and reopening the abdomen should signs of extension of the trouble appear. It is a well-known fact that pus or even fecal matter has a strong tendency to find its way out of an opening in the anterior abdominal wall if it has a chance of access to it, and it will do this even in opposition to gravity. Keetley used to think, until experience taught him otherwise, that such infecting materials preferred to gravitate into the pelvis. They might do this were it not for the fact that the pelvis is already occupied with intestines and other organs which resist displacement. This resistance, of course, is overcome when intraperitoneal fluid can not find a way out through a recent peritoneal wound. Another fact to bear in mind is the impunity with which a limited area of peritoneum may come in contact with septic fluid if the latter is speedily and thoroughly wiped off with sublimated or carbolyzed sponges. Allied to this is the safety with which the intestine may roll into the cavity of a pelvic abscess after that cavity has been thoroughly cleansed. Of course, no sensible person would leave them in this cavity, but Keetley has been obliged more than once to leave intestine as a part of the wall of an abscess cavity because, were the abscess radically dealt with, the peritoneal cavity could not be shut off. In the last few years Keetley has frequently operated on the principles herein stated.

Robert F. Weir¹ describes **an improved operation** for acute appendicitis or for quiescent cases with complications. Some 2 years ago, being led by experience obtained in the oblique incision for gall-stone surgery, in which additional room was obtained by incision of the rectus sheath, drawing the muscle to the median line and dividing the posterior fascia, Weir began to increase the intermuscular space of McBurney by treating the rectus similarly at this level. He at first found it difficult to pull the median edge of the divided fascia of the external oblique far enough inward to expose to a certain degree the anterior sheath of the rectus muscle. Recently he has simplified this procedure by tearing off with the tips of the fingers or with blunt scissors the denuded fascia of the external oblique from the sheath of the rectus up to the median line. He then divides the sheath of the rectus transversely in a line continuous with the opening made in the peritoneum by the original muscle-separating operation. The outer edge of the external rectus is then raised up with the director and carried by a retractor nearly to the median line. The thin transversalis fascia, with the peritoneum beneath it, makes up the posterior sheath of the rectus. In this region the epigastric vessels are visible and can be easily ligated and divided. The sheath and peritoneum are cut in a manner similar to the outer sheath. Retractors will now furnish an excellent exposure of the whole pelvis and of the right iliac fossa. He has used this operative procedure with great satisfaction in 12 cases.

Roux,² discussing the **diagnosis of appendicitis**, insists that too much reliance is placed upon the supposed pathognomonic signs. If a person relies on these signs, he will make grave mistakes. In the early stages of the disease operation is dangerous. Even when the diagnosis of appendicitis is made, there is danger in an early operation, because the case may be simple and in the process of becoming encompassed by barriers. The rule to operate at once in every case on making the diagnosis is wrong; the moment to operate should be carefully selected. In ordinary cases the surgeon should await the subsidence of the peritoneal reaction. In all cases there is a time at which it is proper to operate.

Fred. D. Bird³ offers some remarks on the **parietal incision** in appendiceal operations. He points out two so-called aphorisms, which are specious and untrue, and which have retarded improvement as regards incisions. The first is to make a big incision so that you can see what you are doing. As a matter of fact, you do not want to see; feeling is enough, and the bigger the incision you make beyond 2½ inches, the less you see, because in a larger incision the distended intestines escape and obscure the view. A long incision is not necessary; it increases the risk of future peritonitis in an acute case, and is followed by a ventral hernia if it divides muscles or aponeurosis. Mayo Robson and Abbe have devised lengthy incisions in the lateral wall of the abdomen which separate but do not cut the muscle-fibers, thus obviating the tendency to hernia. This procedure is very useful for

¹ Med. News, Feb. 17, 1900.

² Rev. de chir., Nov., 1899.

³ Intercolonial Med. Jour., Oct. 20, 1899.

operations on the kidney and ureter, and occasionally on the intestine; but is not suitable in this length for the removal of the appendix. Its upper extremity is too far up. Its lower end would have to venture into the hernial region or invade the semilunar line, both of which should be avoided. A skin-cut 2 inches in length is all that is necessary. The single incision is usually sufficient, but occasionally in acute suppurative cases it is necessary to make another incision in order to afford drainage, and the space which we particularly wish to drain is that between the general peritoneal cavity anteriorly and the larger space in front of and external to the colon. As a secondary incision the lumbar cut may be made vertically or it may be made parallel with the iliac crest. The large muscular branch of the circumflex iliac is likely to be wounded and the muscles are very thick, but the tendency to hernia is slight. One of the earliest incisions used in appendicitis is the worst—that in the linea semilunaris. It had to be long because it was some distance from the seat of the disease, and it inflicted damage on the abdominal wall which nature could not repair and a ventral hernia invariably followed. Deaver still cuts in some cases parallel with the semilunar line—an incision almost as bad as a cut in the line itself. Bird also strongly condemns the vertical incision. He refers to the modified semilunar incision which seeks to prevent ventral hernia by displacing the edge of the rectus inward and incising the peritoneum internal to the semilunar line. This incision enters the abdomen too far away from the seat of trouble. It imperils the deep epigastric artery and cuts nerves supplying the rectus; and when these nerves are cut, muscular atrophy follows. Of course, this incision can not be used if an abscess exists. Thus we see that another requisite of a proper incision in appendicitis is that it shall not cut across muscular or fibrous structures, and that, if it is necessary to prolong it, it will not lead away from the disease. Hence the proper incision is that of McBurney or some modification of it. The answer to the question, Where we shall place the incision? depends chiefly upon whether we are operating during an attack or in a period of health. The omphalo-spinous line is an excellent line of demarcation between the upper and outer portions of the abdomen and the lower and inner; but when sections of it are used to express distances from the spine or umbilicus, it becomes misleading. If we take the anterior superior iliac spine as a center and the distance from it to the symphysis pubis as a radius, and describe a circle, we will find that the proportions of different individuals vary to such a degree as to permit the umbilicus to fall inside the circle in some cases and outside of it in others. It is thus seen that a numeric division of this line is wrong, as a quarter of the distance will in one case lead the incision much further into the general peritoneal cavity than in another; and any incision which freely opens the area of the small intestine is wrong. If pus is present, the operator must endeavor to keep close to the parietal wall. In chronic cases we can not be sure how far externally the rectus extends, and we do not wish to interfere with it or with its sheath, and the width of the rectus is an

extremely variable quantity. Induration and pain are not good guides for incision, and visible swelling is not to be used as an indication for the cut. Edema of the skin, however, is a reliable guide for incisions. There is another pseudo-aphorism which Bird combats: namely, that it is unscientific to operate without removing the appendix. The operator starts with the notion in an acute case that he must remove the appendix, and will make his incision further away from the safe place, which is the junction of the anterior parietes and the pelvis, while an operator who is satisfied to open and drain an abscess will adhere as closely as he can to the parietal junction. Among all these varying anatomic and pathologic conditions we have one factor which is constant: that is, Poupart's ligament; and though its obliquity varies in different persons, it affords in an individual case a trustworthy index. An incision made parallel to and near Poupart's ligament will fill requirements, but it must not extend downward into the region of hernia. If the case is one of abscess, the incision should be parallel to Poupart's ligament, from $\frac{1}{2}$ of an inch to $1\frac{1}{4}$ or $1\frac{1}{2}$ inches above it, and beginning an inch or less than an inch from the omphalospinous line. It must be small or it will invade the hernial region. It need divide neither tendinous nor muscular structures, because in this region they can be separated. It does not invade either junction; it divides no nerves, as it is lower than the nerves going to the rectus, and those nerves going to the internal oblique and cremasteric are easily avoided in separating the muscular and tendinous fibers. Furthermore, this incision is some distance from a bony margin. The majority of appendiceal abscesses can be best reached by this incision, although it is not the easiest for the removal of the appendix. When removal of the appendix is required, for instance, in a recurrent case, in a relapsing case, in cases operated on early, etc., the incision should be made directly over the base of the appendix. It should begin $\frac{1}{2}$ of an inch above the omphalospinous line and $1\frac{1}{2}$ inches from the anterior spine and follow the direction of the fibers of the external oblique. The muscles should be separated rather than cut.

Robert T. Morris¹ considers the **best methods in the treatment of appendicitis**. The worst method is that which treats the patient medicinally. Many of these patients recover without further attacks, many die, and a large number have recurrent attacks and are invalids for months and years; it is impossible to determine in advance what course any case will take. Under proper surgical treatment the death-rate in the first stage of an attack is a fraction of 1%. The death-rate under medicinal treatment of any sort is not less than 25%. After medicinal treatment come various bad methods of surgical treatment, each of which has a special death-rate of its own. The use of iodoform gauze packing is harmful. Iodoform-poisoning may be produced, and this is very frequently mistaken for septicemia or exhaustion. Among cases supposed to be suffering from septicemia or exhaustion if a little urine is taken and stirred up with a pinch of calomel in a saucer, it will

¹ Jour. Am. Med. Assoc., July 15, 1899.

show the brownish reaction of iodid of mercury. In cases of iodoform-poisoning the wound seems to be in excellent condition. Plain gauze packing is also injurious. A strong, healthy man could not bear the presence of half a yard of gauze in the abdominal cavity, and still less can a weak and exhausted patient bear it. The gauze packing causes shock and leads to excessive exudation of lymph. This lymph is a rich culture-medium for bacteria, and forms strong adhesions to viscera. Its removal causes so much pain that it may be necessary to give ether, and its presence often causes postoperative obstruction and ileus by its direct mechanical effects; so does a drain in the form of strips of gauze carried to various points among the viscera, because peristalsis may cause a drainage strand to encircle a bowel loop. Further, ventral hernia is likely to follow any case in which gauze packing or gauze strips have been employed. These materials may be replaced with advantage by a narrow drainage-wick covered with gutta-percha, which avoids adhesion to the mesh of the wick, the narrowness of the wick permitting closure and suturing of the wound. Long incisions and multiple incisions are unnecessary. The incision $1\frac{1}{2}$ inches long is sufficient for interval cases or for primary infection cases without abscess. Even if there is abscess and wide-spread infection, a 3-inch incision is quite sufficient. There is an idea that all parts of the peritoneal cavity should be reached by the surgeon if there is wide-spread infection. This is an error. If the chief toxin-bearing collection of fluid is evacuated, if the appendix is removed, if the patient is not kept anesthetized for a long time, and if the bowels are properly managed after operation, we need give little attention to the removal of the septic fluid in the peritoneal cavity, because the polynuclear leukocytes will remove the infected material. Almost any operation, no matter how extensive the complications, should be completed in less than 30 minutes. The custom of leaving infected appendices among adhesions has a death-rate of its own. Such appendices are often gangrenous in part; often contain concretions and mucous inclusions. When one has become trained in adhesion work, he will find it rarely, if ever, necessary to leave such an appendix. The custom of protecting or guarding the peritoneum is a method which may not have a large death-rate of its own, but it certainly causes delay in operative work. It consists in walling-off an abscess with gauze so arranged as to protect the peritoneum. This requires a large incision and time, and is based on conventional ideas of cleanliness rather than on present knowledge. It is much better to work rapidly through a small incision, and to let the pus flow as fast and freely as it will anywhere over the peritoneum, blowing it out with hydrogen dioxid from time to time as the work proceeds. Morris gives citations from current literature of what he considers to be erroneous views on the subject of appendicitis.

J. O. Conor,¹ writing on **appendicitis**, maintains that it is a **local infective malady** which invades the appendix, and by perforation not infrequently destroys the life of the individual. This organ, which is apparently functionless, is especially prone to disease because of its

¹ Phila. Med. Jour., Dec. 2, 1899.

anatomic formation and situation. He places little value upon the classifications into catarrhal, suppurative, gangrenous, etc., for he has frequently noticed that such distinctions are worthless; they imply only phases of the same disease. It is better to adhere to the simple yet clear term "appendicitis." We thus avoid useless theorizing in a complaint whose transition stages are direfully insidious. There are few medical men who, on finding a person suffering from a drum abdomen, vomiting, pulse of 140, and the Hippocratic face, would not make a diagnosis of perforation with diffuse peritonitis; and there are also few who, if they met with a circumscribed, tense, painful, fluctuating swelling in the cecal region, would not diagnose appendiceal abscess. But, if we put out of consideration these self-evident phases of the disease, is there any physician who can correctly diagnose or picture the exact pathologic lesion in a case of appendicitis? The author says that he is not competent to decide these points without the use of sight and touch; and, as the question should be promptly determined, he unhesitatingly recommends immediate celiotomy, thus eliminating an element of doubt and effecting a rapid cure by extirpating the organ and the disease at the same time. It may be asked, Why operate on every case when in a large percentage of cases there is spontaneous cure? He answers: "I am unable to say at the commencement of any case that a patient will recover without operation; I can not guarantee that some sudden emergency might not at any time arise which would render operation useless. Celiotomy and removal of the appendix, pus, etc., is the most exact and rapid method of cure with which I am acquainted; and I do not believe in a large number of spontaneous cures." An appendix once infected is a permanently weak spot, and though there may be no actual recurrence, yet in a large proportion of cases adhesions exist around the appendix and cecum which cause chronic indigestion, with dragging pain and some tenderness in the right iliac fossa, and the appendix itself often becomes adherent to adjacent structures. An abnormally short mesoappendix affects greatly the movement and shape of the appendix. It may lead to kinking or to a tendency to stricture, and may bind the appendix down behind the cecum; in such cases there is likely to be continuous dragging pain in the cecal region, with tenderness at McBurney's point, and the condition is very dangerous if an attack of appendicitis arises, because in such cases gangrene and perforation take place with great rapidity. Conner protests against the application of the term general peritonitis to a limited contiguous peritonitis starting from an affected appendix. By general peritonitis he means a diffuse peritonitis such as is caused by the unrestricted escape of fecal matter into the general abdominal cavity. In all cases of appendicitis there is some peritonitis, which may be limited to the serous covering of the appendix or may be spread by direct contiguity over some adjacent coils of bowel, but such extension does not imply general peritonitis. He operates as soon as possible after the diagnosis has been made in every case. He separates the muscles by McBurney's method, and if any swelling is felt, the incision is made directly over it.

If pus is present, it is removed with sponges; and when the parts are thoroughly dried, a search is made for the appendix, and it is always removed. He never hesitates to break down intestinal adhesions in this search. He thinks that there is more danger in leaving a rotten appendix behind than in separating adhesions and removing the organ. In every case in which suppuration exists he places a large drain on the stump of the appendix. The treatment of appendicitis by applying poultices of ice and administering opium or purgatives and hoping for spontaneous recovery, or setting an arbitrary time for operation, is a medical farce which is never amusing and is frequently disastrous.

George M. Edebohls¹ gives an elaborate review of the **history and literature of appendicitis** which will prove of great service for reference.

C. B. Lockwood² read a paper before the Medical Society of London on the **pathology and treatment of appendicitis**. Lockwood states that the use of clinical statistics is of value, but so far has not carried conviction to the minds of physicians and surgeons. The reason for this is simple: take the cases that are reported to have recovered under medicinal treatment; how do we know this is true? A certain proportion of these cases must have concretions in the appendix. The attack may have passed away, but such a patient has not recovered, because the appendicitis is sure to recur. It would be just as proper to affirm that a patient with stone in the bladder had recovered because an attack of cystitis had got well. Beyond doubt, many cases reported as recovered have subsequently gone to other hospitals and are now included among the severe cases with perforation, gangrene, or septic peritonitis. A correct prognosis of appendicitis can not be made until it is possible to infer from clinical symptoms the pathologic condition of the appendix. Lockwood makes a series of remarks based upon the histologic examination of 53 cases of appendicitis—cases varying from the slightest to the most acute form. The specimens were obtained from cases on which he himself operated. The first group are those cases in which suppuration was absent. Some of these are what might be called by some appendicial colic. In these so-called colic cases no clear attack of appendicitis had ever occurred. They were characterized by slight tenderness on pressure over the iliac fossa, digestive disorder, and occasional attacks of brief pain, often mistaken for renal colic. In speaking of the normal anatomy of the appendix Lockwood called attention to the lymph-follicles and lymph circulation, and showed that the submucous and sub-peritoneal tissues are connected through gaps in the muscular coats, and that through these gaps infection of the mucous membrane quickly spreads to the investing peritoneum. In a case of so-called appendicial colic in which the appendix was removed, the organ appeared normal to the unaided eye, but the microscopic examination showed that the lumen was filled with epithelium, mucous granules, crystalline bodies, diplococci, bacilli, staphylococci, and streptococci. The mucosa was ulcerated and bacteria had penetrated for at least half a millimeter into its sub-

¹ Med. Rec., Nov. 25, 1899.

² Lancet, Jan. 27, 1900.

stance. A surgeon might be reluctant to remove an appendix for a condition known as appendicular colic, because this term does not convey the idea of danger, yet here was a case of so-called colic in which the mucosa was ulcerated and invaded by bacteria. In a case of so-called catarrhal appendicitis the appendix was found to be hard and engorged with blood. Three-fourths of an inch from the intestinal end was a constriction. The mucosa was ulcerated and the lumen was filled with granules, shreds of organic matter, crystalline bodies, and bacteria. A number of glands had cast off their epithelium, plugs of bacteria projected into the lumen, and in some cases bacteria had penetrated the lymph-canals of the mucosa. The term catarrhal appendicitis does not particularly suggest impending danger, and yet here is a patient in whom the condition was certainly one of impending danger. Lockwood discusses the effects of stenosis. In a case in which he operated the mucosa beyond the constriction was lined with epithelium, but the lumen contained pus filled with streptococci. He pointed out the dangers of fecal concretions, showing that fecal concretions are bacterial masses. He said that fecal concretions are always associated with ulceration of the mucosa; that the concretion does not of necessity cause the ulceration, but that the concretion and the ulceration may both take origin from the same cause: that is, the accumulation of bacteria within the appendix. The presence of a concretion in the appendix indicates that there is bacterial invasion and extensive ulceration of the mucosa. A true concretion is a mechanical peril, for when cold is applied to the surface of the body, the appendix may become engorged and the concretion may cause blocking or perforation of the appendix. If it be true that in many of the cases of appendicitis which are thought to have recovered by medicinal means the appendix contains concretions, we can easily understand the peril in which the patients are placed. It is impossible to say when the so-called process of natural cure has been attained. In a case in which a man had had 20 attacks of appendicitis the appendix was removed. In this case the mucosa was destroyed by ulceration and the lumen occupied by a large concretion. An appendix which is once inflamed may become inflamed again, even after a very long interval. Lockwood mentions an interval of 9 years and another interval of 15 years. He does not think it reasonable to lay down rules as to how many attacks should be allowed to pass before the appendix is removed. He is inclined to wait for some time after a first attack of nonsuppurative appendicitis to see what happens; but if after a first attack the appendix remains painful and palpable it ought to be removed, for under such circumstances the general health of the patient is certain to be poor; there is indigestion, flatulence, and often constipation or diarrhea. After a second attack of nonsuppurative appendicitis most patients prefer to have the operation performed. With regard to the question of diagnosis, it is usually possible to say that the appendix is inflamed, but hitherto it has hardly been possible to diagnose with accuracy the actual pathologic state of the appendix. The usual course of events is destruction of the epithelial lining, ulceration of the mucosa, invasion of the

mucosa and submucosa by bacteria, and extension of the inflammation through the muscular openings to the peritoneum. This condition may be complicated by the formation of cicatricial stricture, by inflammatory obliteration of the lumen after the mucosa has been destroyed, by the presence of fecal concretions, by perforation, by gangrene, by inflammation of the lymphatics and of the appendix, and by portal pyemia. It is important to remember that the inflammation may spread along the lymphatics to the right broad ligament, so that appendicitis may be mistaken for ovarian inflammation or salpingitis. Primary tuberculosis of the appendix is a rare disease. In cases of appendicitis in which perforation or gangrene has occurred, the abscess should be evacuated and drained as soon as the diagnosis is made. The safety of the patient depends upon the stage at which operation is done and upon the position the appendix occupies. When the appendix is beneath the cecum and in the iliac region, the chances are good that the abscess is localized. This is also true when the appendix is to the outer side of the cecum and colon; but the appendix, especially in females, may hang over the brim of the pelvis into Douglas' pouch; when such an appendix perforates or becomes gangrenous, the danger is greatly increased, and pus at the bottom of Douglas' pouch is difficult to drain. Lockwood employs the oblique incision parallel to the outer half of Poupart's ligament. This incision can be readily extended to reach an appendix outside of the cecum or one which adheres within the pelvis. The incision is rarely over 3 inches in length. He separates the muscles and does not cut them. In a nonsuppurative case the appendix may be difficult to find, but the organ is never absent except as the result of disease. In cases in which it is difficult to find the appendix it may be hidden in the sub-cecal or the ileocecal retroperitoneal fossa. If there is suppuration and peritonitis, a determined effort should be made to remove the appendix, and it is advisable to take considerable risk rather than to leave an infected appendix which may contain concretions. In some cases in which the appendix has been merely opened and drained, subsequent attacks of appendicitis have occurred; in others, a septic sinus has persisted. A very formidable operation may be necessary to remove the appendix. There are some cases, however, in which the condition of the patient forbids its removal. After operating for appendicitis without suppuration Lockwood closes the wound with a single row of fishing-gut sutures. He does not close it with buried sutures of silk because infection is liable to occur when the lumen of the appendix is cut across. The operation for appendicitis varies much in severity. The simple operation may be compared to the radical cure of nonstrangulated inguinal hernia; but after a severe appendicitis the case may be most difficult, because of the existence of adhesions. [Lockwood's paper is of particular value, as Mr. Sheild said in the debate, because it points out "the correlation between certain pathologic conditions and clinical symptoms, particularly in respect to the infective nature of appendicial lesions." ¹ Sheild believes it justifiable to do without operation only in

¹ Brit. Med. Jour., Mar. 3, 1900.

very mild cases ; operative necessity is measured by initial severity of the symptoms ; and even an apparently mild case which tends to become worse should be operated upon. Cayley took a somewhat more conservative view, but agreed that if the initial symptoms are severe, operation is indicated. He said most observers considered the pulse-rate a guide to the necessity for operation, but the rule does not always hold good, and in a severe case the pulse may not be rapid. He thinks, however, that if the pulse is considered with other manifestations (respiration, temperature, and the abdominal conditions), a proper conclusion can usually be reached. Harrison Cripps, Hunter, Eccles, Moullin, Thomas, Berry, Roberts, Allechin, and others debated Lockwood's paper.¹ In closing the debate Lockwood said that agreement when to operate would be reached only when it became possible to associate clinical symptoms with pathologic changes. The diagnosis must first be made, then the endeavor should be to determine what form of disease exists, and the surgeon must remember that a case which is catarrhal to-day may be gangrenous to-morrow. The only way to diagnosticate the existence of pus is to find it by incision.²]

HERNIA.

Fraenkel³ advocates operation in order to effect **radical cure of hernia** in infants, and he follows the same rule as in cases of harelip : *i. e.*, the surgeon can scarcely operate too soon. He does not believe in employing a truss in an infant, because even when it apparently cures the hernia, there is still the tendency to recurrence in later life, and it interferes greatly with the development and education of the child. Further, in an infant the use of a truss is likely to make the skin sore and to produce intestinal catarrh. The author has operated radically on 68 children, 16 of whom were nursing. He had succeeded in curing by operation 4 cases of strangulated hernia in infants, and was thus led to operate in reducible inguinal hernia. He employs Bassini's method, and in order to prevent infection of the wound, wraps the lower portion of the body in a fixed bandage and covers the wound with impermeable dressings until it heals. He thinks it essential during repair that the patient be kept as much as possible in the fresh air and that his position be frequently changed.

Witzel⁴ believes that abdominal wounds and the orifices from which hernia emerge can be successfully closed by the insertion of **buried nets of silver wire**. The wire which he employs is heavy, the net used should be 3 times greater in diameter than the hernial orifice, and individual layers of tissue are sutured over the net. These pads are allowed to remain in the tissues permanently. They are more satisfactory in the inguinal and umbilical regions than in the femoral region.

W. B. Coley⁵ discusses **congenital hernia of the umbilical cord**. He says that it develops before the falling of the cord, and is due to

¹ Brit. Med. Jour., Mar. 3, 1900.

² Ibid.

³ Centralbl. f. Chir., No. 47, 1900.

⁴ Centralbl. f. Chir., Mar. 10, 1900.

⁵ Med. Rec., Nov. 4, 1899.

defective fetal development. There may be a small protrusion at the root of the cord or the mass may be extremely large, nearly all the abdominal organs being found in the sac of the hernia. As a matter of fact, in this hernia there is not a true sac, the protruding viscera are covered with myxomatous cord tissue, and this layer is overlaid with the amniotic layer of the cord, which is continuous with the skin and the peritoneum. The prognosis is very serious. Until lately the only treatment employed consisted in an attempt to keep the hernia reduced by the use of compresses and bandages. McDonald reported 12 cases thus treated, and 9 of these died. Out of 19 cases treated by laparotomy, only 1 died. The author reports 2 cases upon which he operated, both of which recovered. In operating he cut off the projecting portion of the cord level with the hernia, peeled off the outer layer of the sac, freshened the skin edges at the junction of the root of the cord, reduced the hernial tumor, and sutured the skin edges with silkworm-gut. The peritoneal cavity was not opened.

Audion¹ showed the Paris Society of Obstetrics a child upon whom he had successfully **operated for umbilical hernia one hour after birth**. The hernia was reduced at once and 3 layers of sutures were employed. Charles MacLaurin² reports a case of strangulated inguinal hernia in an infant 14 days old, on which he operated successfully. E. D. Fenner³ reports a case of strangulated inguinal hernia in a 5-months-old baby on which he operated successfully. D'Arcy Power⁴ reports a case of strangulated inguinal hernia in an infant aged 10½ months, in which operation was followed by recovery. H. Cameron Kidd⁵ reports a case of strangulated inguinal hernia in an infant aged 3 months, upon which he operated successfully, making a radical cure. [One of the editors, Da Costa, recently operated in the Jefferson Medical College Hospital upon an infant 6 weeks old suffering from strangulated inguinal hernia. The child was marasmatic and in bad health. The operation was done with the aid of Schleich's fluid. The patient recovered from the operation and the wound rapidly healed. The child continued in a marasmatic condition and died a few weeks later.]

John O'Connor⁶ reports 150 consecutive cases of **radical cure of acquired oblique inguinal hernia**. In this series of cases 1 death and 2 recurrences resulted. O'Connor maintains that the causative factors in acquired oblique inguinal hernia are the funnel-shaped process of the peritoneum and the slight resistance offered by the transversalis fascia at the internal ring. Every operation, to be really radical, must destroy the funnel-shaped process and reconstruct the internal ring. The operations of Bassini and Halsted will fulfil these requirements, but they do too much; for in each of these operations the inguinal canal is first opened and then obliterated, which is entirely unnecessary, because the canal has nothing more to do with causing the rupture

¹ Presse méd., Dec. 30, 1899.

² New Orl. M. and S. Jour., Sept., 1899.

³ Lancet, Oct. 14, 1899.

⁴ Lancet, May 5, 1900.

⁵ Lancet, Sept. 30, 1899.

⁶ Lancet, Aug. 26, 1899.

in an inguinal hernia than have the skin and subcutaneous tissue in an umbilical hernia. Again, in the Halsted and Bassini operations some of the structures of the cord are removed, and the cord itself is placed in an unnatural situation. Consequently, it occasionally happens that the testicle atrophies.

Carl Beck¹ has devised a **new operation for inguinal hernia**. An incision is made down to the internal surface of Poupart's ligament and alongside of the rectus muscle. The lower third of the rectus muscle is exposed down to the shelf of Poupart's ligament. The sac is isolated, ligated, and cut off within the internal ring. The cord is held away, the divided aponeuroses are dissected back, and an oblique incision is made

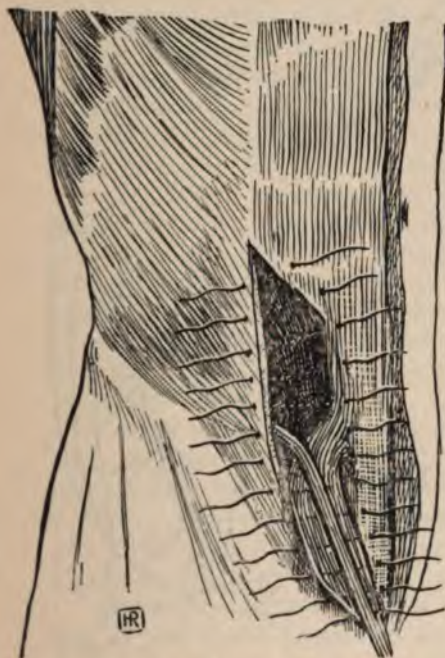


Fig. 23.—Muscular flap, freed and turned downward; cord placed above flap (Beck, in *Med. News*, Sept. 16, 1899).

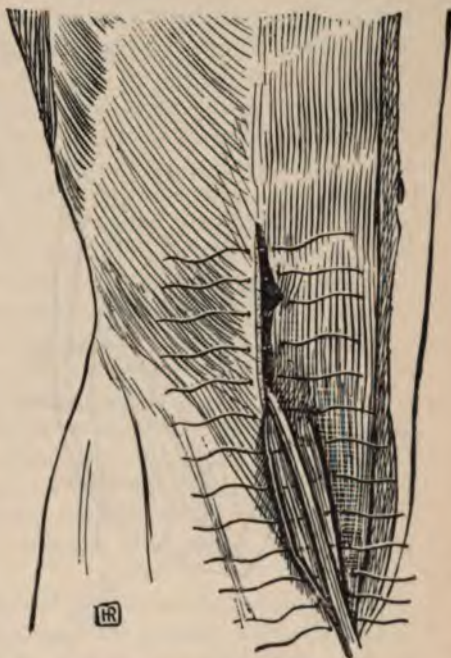


Fig. 24.—Flap held by sutures at Poupart's ligament as well as at the conjoint tendon; gap caused by the elimination of muscular portion united (Beck, in *Med. News*, Sept. 16, 1899).

which divides the lateral fibers of the rectus muscle transversely, somewhat below the lower third of the muscle and for about one-third of its width. The incised fibers are cut from the remainder of the muscle, so that when the upper portion is turned downward, it will reach Poupart's ligament. The muscular flap is then sutured on one side to the conjoint tendon, and on the other side to Poupart's ligament. The sutures employed are of formalin catgut, and they are tied after the cord has been placed upon the transplanted muscle flap. The gap caused by transplanting this flap is closed by suturing the outer margin of the

¹*Med. News*, Sept. 16, 1899.

rectus to the broad abdominal muscles. The divided aponeuroses are sutured above the cord by a continuous suture.

Leonard Freeman¹ explains a **new method of suturing** in operations for inguinal and other forms of hernia. Most surgeons maintain that the Bassini method is the best, and the most important step in the Bassini method is the perfect closure of the internal ring. Occasionally, however, in spite of the utmost care, suppuration occurs. Whenever infection occurs, the infected suture must come away before there will be complete recovery. If catgut has been used, weeks may be required, and a much longer time if silk has been employed. Even if a wound heals by first intention, a sluggish inflammation not uncommonly arises,

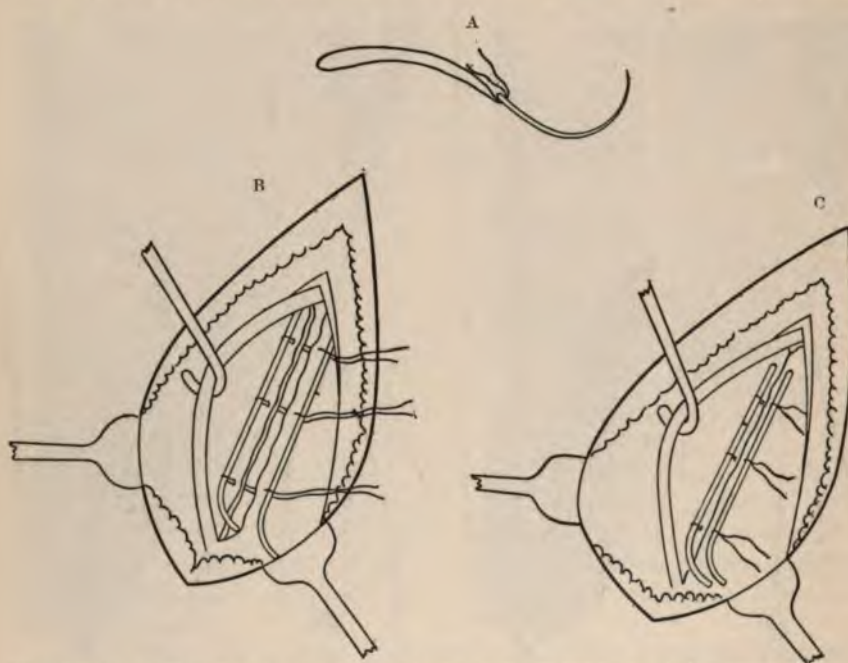


Fig. 25.—A, Showing suture in needle; B, showing position of pins and sutures before approximation; C, showing position of pins and sutures after approximation (Freeman, *Ann. of Surg.*, Mar., 1900).

leading to the formation of a sinus. Endeavors have been made to prevent such complications by the use of removable sutures or by the avoidance of suturing. For instance, Faure split the hernial sac in its long axis and used the divided ends as sutures to unite the borders of the internal ring. An objection to the use of removable sutures is that they will not hold the parts firmly in contact if there is tension; and the second method is applicable only when the sac is long and thick. Freeman has devised a method which is safe and capable of rapid execution. The line of union will withstand any reasonable tension. The sutures will not cut through and a large bunch of muscle can be put

¹ *Ann. of Surg.*, Mar., 1900.

against Poupart's ligament, the barrier being thus augmented, and the sutures can be easily removed. Before the operation 2 or 3 needles are threaded with long loops of silkworm-gut or silver wire. Two pieces of stiff silver wire are taken, long enough to reach the entire length of the inguinal canal. Small probes will do very well for this purpose. The internal ring is exposed, the sac is ligated and cut off, and the cord is held out of the way. One of the silkworm-gut loops is passed from without inward through the muscle-tissue on the umbilical side of the ring, well back from the margin and tolerably close to the point of exit of the spermatic cord. The loop is then carried through Poupart's ligament from within outward. Another loop is inserted near the pubic end of the opening. One of the pieces of prepared wire is run through the loops, which are pulled tight enough to hold it in place. The other wire is laid along Poupart's ligament between the free ends of the loops, which are firmly tied over it. The wires are thus approximated. Before the wires were finally inserted they should have been bent upward at their pubic extremities, so as to protrude through the external incision. Their removal will thus be facilitated. The cord is dropped in place over the line of union and the aponeurosis of the external oblique is united above it, the upturned ends of the wires passing through the external ring. This aponeurosis can be sutured either with Harris' removable suture or with catgut, because this structure is not subject to tension. In uniting the skin the free ends of the loops and the ends of the wires are brought out through the incision between the stitches. In from 10 days to 2 weeks the wires are removed; this frees the loops, which are likewise extracted. It should always be remembered that after union has taken place sutures are of no use. If there is no tension, they are superfluous; if there is tension, they are equally superfluous, because they will cut out. Freeman has used the foregoing method in 3 cases. [The method seems somewhat complicated. We are not impressed with the ill effects of buried sutures to a degree which would suggest to us to abandon them.]

Monprofit¹ reports a case of inguinal hernia in which during operation it was found impossible to separate the hernial contents and to reduce the mass. It was necessary to **resect the intestine**, and he removed a portion of small intestine 7 feet 6 inches in length and a portion of large intestine 32 inches in length. The mass was composed of ileum, cecum, ascending colon, and half of the transverse colon. Each end of the divided intestine was closed by sutures, and a lateral anastomosis was made to reestablish the fecal current. This patient recovered, and some time after the operation was in a satisfactory condition, although he was unable to digest meat.

Coley,² in an address on the **radical cure of hernia**, gives the history of various operations, and discusses in detail different methods used at the present day. He considers that Macewen's method of plugging the internal ring with a pursed-up sac is not good, because this structure may slough or suppurate, and in some cases may com-

¹ Rev. de chir., Nov., 1899.

² Montreal Med. Jour., Sept., 1899.

pletely disappear. He thinks that when Macewen's operation succeeds, the cure is due to the careful closure of the canal rather than to the obstruction offered by the pursed-up sac. He objects to Kocher's operation on like grounds. He disapproves of Halsted's operation because it divides the internal oblique and because atrophy of the testicle may follow the removal of the veins. He maintains that Bassini's is the best method, and thinks that it will supplant all others. In 1890 Bassini published 250 cases, with 1 death and 7 relapses, the cases having been observed for from 4 months to 4½ years. Coley has operated for inguinal hernia 459 times. He has had 5 relapses, and 1 death due to pneumonia. He uses chromicized kangaroo tendon as a suture material, and healing by first intention has occurred in 96 % of the cases. In a study of relapsed hernias he has found that in 64.5 % of cases relapse occurs during the first 6 months after operation, and in 80 % of cases during the first year. Hence if a patient is cured 12 months after an operation, it is probable that he will remain cured. [We have always been somewhat uncertain as to when it can be said a case is cured. Coley's paper goes far to convince us that the one-year limit is in general a proper test.]

Harvey Cushing¹ makes some observations on the **neural anatomy of the inguinal region** relative to the performance of herniotomy under local anesthesia. He shows that if care is taken to properly infiltrate the area with Schleich's fluid, and if the nerves which supply the part are sought for, exposed, and cocainized, even extensive operations can be done with a very trivial amount of suffering. He explains with great care the necessary technic, and any deviation from this method, or any carelessness, will render the operation unsatisfactory. [If spinal anesthesia shall prove safe and reliable, it may come to supplant Cushing's procedure. Schleich's fluid, when used as Cushing suggests, is very efficient and satisfactory—that is, it is efficient and satisfactory after some experience with it. In the first few attempts the anesthesia is not so perfect as in subsequent trials.]

Harry Lane² advocates the following **method of treating inguinal hernia**: He introduces a needle into the inguinal canal and for 20 minutes passes a current of electricity of a strength of 20 ml. He then applies a truss and has the patient wear it for 2 months. He asserts that by this time a cure of hernia has been effected. [We can not conceive that this plan can have any value, beyond amusing and interesting the patient, and amusement is not of real value.]

E. Wyllys Andrews³ describes the **technic of Bassini's operation** as performed by Bassini. Bassini takes about 20 to 25 minutes to operate on an inguinal hernia, and if the hernia is double, he takes from 35 to 45 minutes. The surgeon and his assistants scrub their hands for nearly 30 minutes before placing them in sublimate solution. Before an anesthetic is given the field of operation is prepared by prolonged scrubbing with soap and water, washing with quantities of deci-

¹ Johns Hopkins Hosp. Bull., Mar., 1900.

² Med. Sentinel, Aug., 1899.

³ Med. Rec., Oct. 28, 1899.

normal salt solution, pouring corrosive sublimate (3:1000) in quantity over the parts, and placing compresses wet with this solution upon the field of operation. Leg covers made of rubber cloth are drawn over the legs and thighs and rubber cloths are placed over the upper part of the body. Gauze pads in several layers are laid over the intervening parts and sublimate solution is poured over them. Gauze is tied over the genital organs. Sublimate solution is used freely before the incision and after closure of the wound, but none is poured into the tissues, although the hands of the surgeon and his assistants are dipped in it and sponges are washed in it. The knees of the patient are strapped to the table and chloroform is administered. The gauze over the hernial region is opened from the pubes to the iliac spine and a space is inclosed which is not much larger than the skin incision. The skin and fat are drawn into a fold which is transverse to Poupart's ligament, and this fold is drawn up and incised. The incision is from 12 to 18 cm. long and is 3 or 4 cm. above Poupart's ligament. By this method the aponeurosis of the external oblique is laid bare with one cut, and the pillars of the external ring are brought into view. Bleeding points are grasped with forceps. The canal is laid open from above downward, the cuts being parallel with the aponeurotic fibers. The aponeurosis of the external oblique is dissected up with the handle of the scalpel until on its inner aspect Poupart's ligament is exposed. The cord mass, which contains the cremaster muscle, the hernial sac, and the cord, is lifted up by blunt dissection, and adherent masses of fat are stripped away. The cremaster muscle may be removed in like manner. The sac is isolated first at its neck. The neck is separated from the internal ring, the parietal peritoneum being separated for a distance of 2 cm. all around the internal ring. This renders it possible to remove the sac so high up that no funnel-shaped depression will be left when the ring has been repaired. The fundus of the sac is opened and its interior is examined, and if there are no adherent contents, a clamp is placed upon its neck high up. If there are adherent masses of omentum, they are separated, and after bleeding has been arrested are returned to the abdomen. Such a mass should be removed only when it is hard and thick. A strong silkworm-gut ligature is tied around the neck of the sac above the clamp. If the sac is small, this is quite sufficient. If it is large, both ends of the ligature are threaded upon a needle, passed through the stump, and tied around over the first loop. The sac is cut across just below the clamp and the clamp is removed. The effect of loosening the parietal peritoneum from around the ring was to loosen the transversalis fascia and internal oblique muscles, so that now the margins of the ring are free and undermined. In order to make the insertion of the stitches easy, a forceps is used to grasp the transversalis fascia and the internal oblique muscle. The blade of the forceps is just outside of the peritoneum, but within the internal ring: *i. e.*, the forceps grasps the posterior wall of the canal, with the exception of the peritoneum; and in some cases a flat director is inserted into the internal ring, to push the posterior wall forward and steady it. The important step in

the operation is the insertion of the deep sutures ; and while this is being done, the aponeurosis of the internal oblique is held apart by retractors, so that the inner aspect of Poupart's ligament is distinctly visible. The cord is held out of the way by means of a loop of silk. The operator takes a good-sized piece of silk, which has been sterilized by boiling in glycerin, and which has been placed in antiseptic fluid, and threads it upon a semicircular needle of the self-threading sort. The deep sutures are inserted first close to the pubic bone. The first one or two will probably take up part of the sheath of the rectus and the rectus muscle. Each stitch passes through the transversalis and the internal oblique, on the inside, and is then carried through the shelf-like edge of Poupart's ligament from within outward. From 4 to 6 of these stitches are placed behind the cord, and the last one narrows the internal ring so that it fits tight around the cord. While the lower stitch was inserted first, the upper one is tied first. The distance between the stitches is from $1\frac{1}{2}$ to 2 cm. These stitches not only restore the length of the canal and its obliquity, but also invert the upper or muscular part and draw it somewhat behind Poupart's ligament—in other words, produce overlapping or imbrication, and give a broad surface of union. The cord is placed in the new canal and the external oblique is sutured over it, the outer angle being lifted on a hook, and two stitches are placed here and tied ; then a continuous suture is inserted down to the pillars of the external ring, and 1 or 2 interrupted sutures are used to make the ring of the proper size. Every bleeding point is now ligated and the skin is closed by a continuous suture of silk. This continuous suture is applied as follows : The two edges are bunched up and both transfixed by the needle ; while the needle is still sticking through the skin, the thread is wound twice around its point, after which the needle is pushed through. Drainage is not used unless there is obstinate oozing. The wound is dressed by compresses of gauze wet with corrosive sublimate solution. Over these compresses are placed quantities of salicylic cotton, enveloping the hips, the thighs, and the abdomen, both front and back. Over this is applied a bandage of wet starch and lime, which bandage reaches from the middle of the thighs to the middle of the abdomen. This bandage furnishes a firm and dry support, but is not so rigid as plaster-of-Paris. On the eighth day the hernia is redressed, and on this day the skin suture is removed, a light gauze dressing is applied, and the patient is permitted to get out of bed and go home, being told to remove this dressing in a few days. He is not told to limit exercise and no truss or support is worn. [Andrews' article is extremely valuable. It is clear, definite, and positive, and sets forth accurately the method of Bassini as practised by himself.]

J. Coplin Stinson¹ presents some observations on the **surgical anatomy of inguinal hernia** and upon methods of cure. He advocates a method of operation which he described in a previous paper.² He says that it completely obliterates the sac, allows the safe transmission of the cord and its structures without any danger to the testicle,

¹ Ann. of Surg., Oct., 1899.

² YEAR-BOOK for 1900, p. 102.

and closes most satisfactorily the opening in the abdominal wall. He then reviews the advantages and disadvantages of the following operations: Bassini's, Halsted's, Macewen's, Kocher's, Fowler's, and Nélaton's.

Robert F. Weir¹ writes on the treatment of the **sliding hernias of the cecum and sigmoid flexure**. The natural looseness of the peritoneum in the iliac regions sometimes allows a portion of the large intestine to slide into a hernia. The contents of such a sac vary from that of the ordinary sac; for the sac is not formed of a bulging layer of parietal peritoneum, in which lies omentum or small and large intestine, but in these slipped hernias there is an important variation—the peritoneal sac is imperfect, usually on the posterior and lateral aspect, where the loose peritoneum passes over the herniated bowel to its other side. In other words, the bowel is still outside of the peritoneum. It passes down and carries with it a fold of loose peritoneum, just as in the descent of the testicle, and the congenital cecal hernia is produced by the same agent that aids in the descent of the testicle: *i.e.*, by the gubernaculum. This process is included in the fold of peritoneum that holds the cecum, and hence it occasionally happens that the cecum is drawn down after the testicle. Not every case of hernia of the cecum or of the sigmoid answers the foregoing description; most cecal hernias and many sigmoid hernias have complete sacs, because they are usually entirely covered with peritoneum in the normal state. This fact is especially true of the cecum and appendix. In all but about 18% of the cases the cecum is mobile and has a perfect peritoneal covering. The mobility of the cecum and a similar condition of the sigmoid explain why so many cases of hernia of the cecum and sigmoid have been radically treated surgically with success. Weir does not consider such cases in this article. He calls attention to the fact that when the colon retains a long mesentery which it possesses originally, the cecum can find its way into a left-sided hernia, or, vice versa, the sigmoid can appear in a right-sided hernia. These facts also explain the existence of appendicial trouble on the left side. Almost all cecal and sigmoid hernias can be reduced. That is equivalent to saying that most of them have a complete sac, the intestine resting free within it. Weir then goes on to explain the essential difference, as it is usually set forth, between a cecal hernia and a hernia of the ascending colon on the right side, and a sigmoid hernia and a hernia of the descending colon on the left side. With few exceptions the cecum should be regarded as completely surrounded with peritoneum. The sigmoid flexure is the most mobile portion below the brim of the pelvis, and rises above this line only when distended into the upper pelvis. The descending colon terminates in the iliac fossa and is adherent to the iliac wall, peritoneum being absent over from one-fourth to one-eighth of its circumference. The colon on each side is usually detached, as described; but it may happen to be movable, because of the existence of a mesocolon of variable length. Hernias which are spoken of in this article as those caused by a slipping cecum or a slip-

¹ Med. Rec., Feb. 24, 1900.

ping sigmoid are in reality hernias which involve the ascending or the descending colon. This class of hernias and subperitoneal hernias of the ascending or descending colon present great operative difficulties, of which Weir has made some surgical studies. Of 20 cases in which the descending colon, either alone or with the cecum or the sigmoid, was involved, the sac was complete in 7 cases; in 5, the point could not be ascertained; and in 8 the hernia was by slipping. When a hernia is formed by slipping, there is a great amount of irreducibility, and surgical interference is advisable. If strangulation exists,—which occasionally, although rarely, happens,—the surgeon should, of course, relieve the obstruction, but will often be unable to bring about a radical cure. The bowels which have slipped into the hernial sac are held in position by the connective tissue, which is usually posterior and to the side, and which is generally dense and thick; hence ordinary pressure will rarely replace the protruded bowel. These hernias are more common on the left side and in males who are middle-aged or elderly. Their nature is rarely determined before operation. They may be at first reducible, but soon become permanently irreducible. They are usually scrotal. If the hernia is on the left side, one may suspect that it contains the sigmoid flexure or descending colon, because it is impossible to inject a large quantity of fluid per rectum, or because after such an injection the hernia perceptibly enlarges. The problem, however, is so difficult of solution in most cases that time is ill spent in endeavoring to reach a conclusion. In doubtful cases it is wiser to make an incision into the sac to the inner side of the scrotal enlargement, and not to carry it too low down, thus avoiding dropping upon and opening a piece of unidentified bowel which has no covering of peritoneum. On opening the sac-wall, if there be found a small intestine and omentum, they can usually be easily reduced; but should strangulation exist, it must be first relieved. The surgeon may come upon some enlarged epiploic processes which hinder reduction. He may attempt to reduce these one by one. This reduction may fail or may temporarily succeed, as they often come out again when pressure is relieved. However, the reduction should be attempted, in order to enable the surgeon to study postperitoneal conditions of the bowel. Weir has treated surgically 6 cases of sigmoid hernia and 4 cases of simple hernia. In 2 of the sigmoid hernias he separated the bowel by a dissection carried on chiefly with the finger, and after loosening it and carrying it into the peritoneal cavity, he sewed up the ring and canal. Coley has operated in a similar manner on 3 patients. In 3 cases Weir succeeded in pushing up the protruded bowel, although it required some effort, and in suturing the internal ring; but in a few months the hernia reappeared. In several other cases he operated in the following manner: He concluded that it was surgically incorrect to reduce the bowel after dissecting it from the sac, as it placed a raw and thin bowel in the peritoneal cavity. He attempted in these cases, after separating the bowel from its bed, to cover the raw surface with peritoneum taken from the sac. He accomplished this, dissecting it up on each side of the bowel to a little above

the level of the internal ring, and to a short distance below the bowel. He then loosened the bowel with the finger or by snipping with scissors until it was released above the internal ring. He opened the ring widely by retractors or even by cutting. He took the loosened peritoneum and sutured it as far as could be behind the gut, and carefully sutured the ring after the bowel had been reduced. If the patient consents to the removal of the testicle on that side, radical cure may be expected. In a very bad case it would be better to perform a hernial laparotomy, in order to allow of a more thorough separation of the bowel and to permit of fixation of the bowel above, thus preventing recurrence.

A. Laphorn Smith¹ writes on the **prevention and cure of hernia following abdominal operations**. He considers this condition to be frequent; and its occurrence not only harms the individual, but often leads other persons to refuse to subject themselves to necessary surgical procedures. It is a condition which can be prevented by leaving in through-and-through stitches for a month in thin women, or by using two layers of nonabsorbable buried sutures in fat women. It can also be prevented by doing away with the abdominal drainage-tubes and drainage-strands, draining through the vagina if it be necessary. It is necessary to bring the edges together with great care, and this will be accomplished best if the points where the stitches are to pass through are marked; great care must be taken that no peritoneum is bulged up between the muscles and fascia. A small postoperative hernia is readily cured with a single buried purse-string suture of silkworm-gut. A large protrusion may be cured by incising the edges of the ring until the recti muscles are thoroughly exposed, and suturing them together with buried sutures of silkworm-gut. The patient who has been treated with a buried suture of silkworm-gut is required to remain in bed only 2 weeks, and does not have to wear an abdominal support.

Francis B. Harrington² discusses the subject of **hernia following operations for appendicitis**. His conclusions are that hernia frequently occurs after an appendicidal operation, because of the separation of the muscles and other tissues in the scar, and that hernia is particularly common if drainage has been employed. He opposes the transverse cutting of muscles and tendon-fibers in an appendicidal operation unless it is absolutely necessary; and if drainage is employed, he thinks that we should use as little drainage material as possible. If drainage is employed, the wound is sewed up as far as possible, and the drainage is removed as early as is consistent with safety. If it is possible immediately to suture the wound after an appendicidal operation, layer sutures are advisable. After such an operation the employment of belts and trusses does no good and may do harm, but from the earliest period possible after an operation appropriate exercise should be employed to develop the abdominal muscles. If a hernia should form, the operation for its relief is safe and satisfactory.

Francisco³ writes on **inflamed nonstrangulated hernia**, and re-

¹ Pacific Med. Jour., Nov., 1899.

² Boston M. and S. Jour., Aug. 3, 1899.

³ Beiträge z. klin. Chir., vol. XXVI, p. 2, 1900.

ports 59 cases. He makes the following classification of such conditions: When there is inflammation of an empty sac, abscess of a sac, inflamed enterocele, inflamed epiplocele, inflamed hernia of the appendix vermiformis, and inflamed irreducible hernia. Every one of these cases should be operated upon as soon as the diagnosis is made. This plan was followed in his cases, and all recovered. The author points out the danger of taxis in such a condition, maintaining that it may tear the omentum, the appendix, the ovary, or the tube. If there is inflammation of an empty sac, the diagnosis is difficult and taxis is peculiarly dangerous. Inflammation of a sac may directly cause strangulation; it leads to the formation of adhesions, which make the hernia irreducible, and early operation will prevent such a result. An inflamed hernia should always be operated upon. [We entirely agree with Francisco that an inflamed hernia should always be operated upon.]

R. Lawford Knaggs¹ writes a comprehensive and instructive paper on **volvulus in association with hernia**, and reports 2 cases of hernia in which strangulation depended upon a volvulus. He thinks the condition is rare. Guy's Hospital postmortem records for 12 years exhibit only the 2 cases which he reports in this paper. The cases which he has collected are divided into 4 groups: (1) Volvulus of the hernial contents, the neck of the volvulus being within the hernial sac or close to the hernial aperture; cases of this group are subdivided into those in which all the intestinal contents are involved and those in which only a portion of the intestinal contents are involved. (2) Volvulus in which the contents are implicated, but where the neck and some of the affected coils lie within the abdomen. (3) Volvulus produced within the abdomen by the reduction of the hernia. (4) Volvulus occurring within the abdomen from some predisposing condition more or less directly connected with the hernia. He considers each of these groups in detail, discusses their mode of recognition and their surgical treatment, and analyzes all reported cases.

Jonathan Hutchinson, Jr.,² writes on the **vermiform appendix in relation to external hernia**. He says that a distinguishing feature of hernia of the appendix is the frequency with which inflammation and suppuration occur within the sac, and that many cases reported as those of strangulation of the appendix are really cases of acute appendicitis within a hernial sac. In some cases the pressure of a truss or the effect of repeated taxis has been blamed for the condition, but other factors are probably also at work. When the appendix becomes the permanent inmate of a hernia, its contents will be liable to stagnate and decompose. The blood supply of the appendix may be interfered with by kinking or direct pressure, and bacteria will have a better opportunity to attack its wall. Occasionally a foreign body leads to a perforation of the appendix. He reports a case in which a foreign body did cause such an attack. It has been questioned whether a true strangulation of the appendix ever takes place; but we should remember that the appendix, with the fat investing it, is larger than a loop of

¹ Ann. of Surg., April, 1900.

² Brit. Med. Jour., Oct. 21, 1899.

small intestine, and the nature of its blood supply—as the appendix is a terminal organ—favors its strangulation by a hernial ring. In many cases of hernia of the appendix, death has resulted from extension of suppuration upward, and in some cases from the return of the inflamed organ into the peritoneal cavity. Sometimes the appendix becomes the seat of relapsing attacks, just like those observed in the iliac fossa. Hutchinson does not think that any one has as yet maintained that inflammation of the appendix is the cause of its passing into the femoral or inguinal ring. We know, however, that an inflamed appendix is often swollen, stiff, and elongated, and under certain conditions becomes an erectile organ. When the appendix is free, it is often directed forward, its apex being just behind Poupart's ligament; and it seems probable that when such an appendix becomes inflamed, it may protrude further and adhere to one of the pouches in the femoral or inguinal ring. Hutchinson advances the theory that an attack of appendicitis may lead to the first protrusion of the hernia. This view will explain cases in which there is an inflammatory attack, and yet the writer finds no evidence of strangulation in the hernia cases in which the tip of the appendix only is adherent to the wall of the sac, and cases in which pain in the iliac fossa with sickness has preceded the formation of any recognizable hernia. The fact that a clear history of antecedent appendicitis may not be obtained does not disprove this theory, because we know that the symptoms of appendicitis may have been extremely slight; many persons go through a slight attack without even sending for a physician, and even repeated attacks may leave an apparently healthy appendix. The frequency of appendicitis may be roughly estimated from the fact that nearly 20 % of adults who had died from other causes examined on the postmortem table at the London Hospital showed signs of old disease of the vermiform appendix. According to one writer, the percentage is even higher—40 % to 50 %. Hutchinson believes that hernia of the vermiform appendix would be more common but for two facts: (1) In 40 % of the cases the appendix has no mesentery and is anchored; and even when it is comparatively free, in many cases it is directed upward behind or at the side of the colon. (2) The appendix may be so short that it is impossible for it to enter the hernial ring. Inflammation of the appendix when it has passed into a hernia changes its shape so as to make it almost unrecognizable at the time of operation. If the appendix is overloaded with fat, it may be very difficult to detect it in a hernia. In a case of hernia of the appendix, if the walls of the sac are thin and the appendix has not been inflamed, the latter may be recognized by its worm-like form. This recognition is sometimes possible in cases of congenital right inguinal hernia in young adults, and in such cases the appendix can be returned into the abdomen. If there is an adherent and inflamed appendix, the diagnostic difficulties may be great. There may be no symptoms of strangulation, or only ill-marked symptoms, and the hernia, especially if it is femoral, may be only the size of a walnut. On incision it is usually found that the sac is very thick. In some

cases the sac has not been recognized, but an abscess cavity has been opened, at the bottom of which lay the appendix. The appendix may be wrapped in omentum, but in many cases it is the sole inhabitant of the sac. In females the swollen appendix may resemble a Fallopian tube. In an inguinal hernia the appendix has been mistaken for an inflamed spermatic cord, and it may be impossible to distinguish between the appendix and Meckel's diverticulum in a hernia. Hutchinson then discusses the treatment of the appendix in a hernia. He says that if there is no evidence of septic inflammation, it is usually safe to return the appendix after separating adhesions; but he thinks that if its root can be reached, the diverticulum should be excised, because the organ will be liable to recurrent attacks. Cases in which the appendix is acutely inflamed, or even gangrenous, are much more difficult to deal with. If the appendix is allowed to remain in the hernia, a fecal fistula may persist, and a subsequent attempt to cure the fistula may cause death. Septic peritonitis may spread from the sac or fatal fecal extravasation may occur. If only the lower part of the appendix is inflamed, and a healthy part can be reached, the appendix should be excised as near the cecum as possible. It is not proper to fix the stump at the neck of the sac, for to do so will prevent a radical cure of the hernia. The infected sac and any omentum which is present should be ligated and excised. If the appendix is ulcerated high up at the neck of the sac, a second incision should be made above Poupart's ligament, through which the appendix can be removed, disinfection carried out, and drainage employed. If, because of inflammatory adhesions, the surgeon has been forced to leave an inflamed appendix within a hernial sac, as soon as the local condition improves he should excise the organ. The appendix is found in a femoral hernial sac only in adult life or in old age, but the condition in the inguinal canal may occur at any age, and the appendix may even be present in the inguinal hernia of a woman. In males the cases are divided into those of congenital and those of acquired origin. Hutchinson then discusses congenital inguinal hernia of the appendix, with or without the cecum, and reports a case. [Bajardie, in 98 cases in which the hernia contained only the appendix, found only 4 which were reducible. In 47 of these cases the appendix was strangulated and in 30 it was inflamed. In rare cases the appendix is found on the left side. Reuben Peterson¹ has recently reported a case of right inguinal hernia of the vermiform appendix. He removed the appendix.]

DISEASES OF THE LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN.

H. D. Rolleston and G. R. Turner² report 2 cases of **ascites due to cirrhosis of the liver** which were treated surgically by the production of peritoneal adhesions. One of these cases improved greatly. The ascites almost entirely disappeared, and 5 months after the opera-

¹ Jour. Am. Med. Assoc., Dec. 2, 1899.

² Lancet, Dec. 16, 1899.

tion the patient was in vastly improved health, but was left with an enlarged spleen. Hence he can not be recorded as cured. In the second case the ascites recurred again and again, although the patient's general condition was better than before the operation. It is possibly a mistake in this case to record the prolongation of life as due to the operation. It is true that subjects of pure cirrhosis seldom live to be tapped more than once or twice, but occasionally patients with ascites due to cirrhosis do recover, and this exceptional event must be thought of, in considering the effect of operative treatment. It might be suggested that the mere opening of the abdomen alters the conditions as it does in tuberculous peritonitis; but many times in these cases the abdomen has been opened because of a mistake in diagnosis, and operation has not been followed by improvement. Simple abdominal section, with nothing else, is of no value in hepatic cirrhosis. Of the 10 previously published cases of operation in hepatic cirrhosis, 4 recovered and at least 3 died from the effects of the operation. The operation should be performed at a comparatively early period and should not be deferred until the patient is greatly debilitated. Individuals with cirrhosis are bad subjects for operation and are peculiarly prone to infection. Of the 10 cases published, 2 died from peritonitis and 1 from shock. Early operation is advisable also because it is important to intervene before the liver tissue is so degenerated that it is unable to undergo compensatory hyperplasia when the blood supply is improved by the formation of adhesions. Medicinal measures should be employed while the diagnosis is in doubt, and should be particularly directed to combating any possible syphilitic disease of the liver. When a course of iodid of potassium does not improve a case of ascites thought to be due either to cirrhosis or to syphilitic disease, pure medicinal treatment should be abandoned and operative measures adopted. When cirrhosis can be diagnosticated with a fair amount of certainty before ascites develops, and when there are evidences of the disease, such as vomiting of blood and splenic enlargement, operative interference will probably be more successful than in the later stages. The authors are inclined to believe that the treatment of cirrhosis of the liver by early operation has a future before it. Of the 2 cases which these writers recorded, that one did best in which an oblique incision had been made along the costal margin, the omentum being stitched between the liver and the diaphragm. The oblique incision gives the readiest access to the superior surface of the liver on both sides of the suspensory ligament and makes it easier to stitch the omentum to the upper surface of the liver between it and the diaphragm. The oblique incision is preferable to the incision in the semi-lunar line. There is less chance of getting satisfactory vascular adhesions if we simply stitch the omentum to the abdominal wall than if we stitch the omentum to the liver and the abdominal wall. There is very little bleeding from a cirrhotic liver when stitches are passed through it. If there is a large amount of fluid present which has accumulated rapidly after a previous tapping, suprapubic drainage

should be used. After the operation the patient should be kept, as far as possible, in the sitting position. This position allows of a more satisfactory formation of adhesions of the stitched structures in the upper abdomen. The question is, Does the improvement in the general health and in the local condition—*i. e.*, the disappearance of the ascites—simply depend upon the development of a collateral circulation, which relieves the pressure on the portal vein? This was the assumption on which the operation was planned. Against this it may be argued that ascites does not occur when the blood pressure in the portal vein is presumably highest—*i. e.*, early in the course of the disease, when there is vomiting of blood; again, ascites is a late manifestation and seems to be the result of a toxemic condition rather than of the mere mechanical effect of increased portal pressure. It seems to be a toxemic state in which the poison exerts a lymphagog action. The toxemia is due to the fact that the cirrhotic liver is unable to destroy the poison that continually passes to it from the alimentary canal. These poisons reach the general circulation and cause edema of the feet, ascites, and nervous symptoms. If the collateral circulation between the peripheral parts of the portal vein and the general systemic veins is markedly increased, less blood will go through the liver and the toxemia will be increased. The collateral circulation between the portal and the general venous systems is carried out to its logical conclusion in Eck's fistula. In this experiment the portal vein is interrupted in the portal fissure. Its proximal end is closed, while its distal end is made to join the inferior vena cava. This proceeding short-circuits the portal circulation, and all blood from the intestine enters directly into the inferior vena cava. In dogs this procedure produces a disposition to uremia. In one of Morrison's operations for cirrhosis it was noticed that the patient had periods of alternating excitement and depression for several weeks after the operation, and this condition was regarded as being produced by intestinal products passing directly into the general circulation. It would thus seem that an increase in the collateral channels between the portal veins and the systemic veins might lessen the engorgement of the portal vein. It would not tend to improve the general health, but would rather make it worse. It therefore becomes obvious that the good effects of the operation are not entirely due to relieving the pressure in the portal vein. There are two possible ways in which the operation can do good: (1) By diminishing somewhat the flow of blood through the liver it may allow that organ to deal more completely with the blood which does pass through it, and so reduce the toxemic condition which is so large a factor in inducing ascites; (2) the increased blood supply to the liver surface improves the nutrition and may cause the hepatic cells to undergo compensatory hyperplasia, the organ growing more active in antitoxic functions and the symptoms of the disease becoming latent. If this last hypothesis is true, it follows that the operation should be performed only before the liver tissue is so disorganized that compensatory hyperplasia is impossible. [A short time ago Spencer and Roe performed this operation in a case in the

Jefferson Medical College Hospital, and there has been distinct improvement. F. Tilden Brown¹ reported a case greatly benefited by operation. Robt. F. Weir² operated a year ago, but the patient died of peritonitis within a week. In the debate in the Medical Society of London upon the paper of Rolleston and Turner the matter was instructively discussed and cases were cited to prove that simple tapping might cure ascites. [There seems to be no doubt that the operation is of value in some cases. It must be determined which cases are proper for operation and which are unfit, and whether or not drainage should be used.]

Thomas Carwardine³ reports a case of **ruptured liver** in which an operation was successfully performed when the patient was pulseless. The patient was a man 25 years of age who had been crushed against a wall by an object weighing half a ton. The accident happened at 9 A. M. At 11 A. M. the pulse had become very weak and the area of liver dullness was increased. Four hours after the accident he was practically pulseless. Saline fluid was injected into a vein and an operation was rapidly performed. A large clot was turned out of the abdominal cavity. There was a huge laceration of the liver right across the under surface, almost dividing the liver. Suturing was out of the question. The wound in the liver was packed with iodoform gauze. The patient remained pulseless for 30 hours, after which time the pulse became perceptible and gradually improved, and the next day the patient's condition was excellent. He finally recovered completely.

Tricomi⁴ considers different methods for **arresting hemorrhage from the liver**. If the wound is superficial, he approves of the use of the Paquelin cautery. In a deeper wound he uses suturing, and in a very deep wound he packs with gauze. In 49 cases of wounds of the liver the mortality after the use of sutures was 30 %; after the use of gauze packing, 19 %. If it is necessary to resect a portion of the liver, the bleeding vessels may be tied and an intra-hepatic ligature employed, but it is better to tie the vessels separately and then to plug with gauze. A good way of avoiding hemorrhage is to perform the operation in 2 stages. Tricomi studies 63 reported cases of partial resection of the liver. In 23 the stump was fastened outside of the peritoneum. If bleeding can be completely arrested, it is better to leave the stump inside the peritoneum; but, as a rule, we can do this only in a tumor which is of small size and pedunculated. In a large tumor operation in 2 stages is advisable. Tricomi reports 5 cases of hepatectomy with 4 recoveries. Two of the operations were for syphiloma, 2 for adenoma, and 1 for hydatid cyst.

Subbotic⁵ reports 2 cases of successful **suture of a wound of the liver**.

Theodore A. McGraw⁶ reports a case of stab wound of the liver and right pleura with recovery. McGraw stuffed 4 aseptic towels into

¹ Ann. of Surg., April, 1900.

² Lancet, May 12, 1900.

³ Centralbl. f. Chir., No. 28, 1899.

⁴ Med. Rec., Feb. 4, 1899.

⁵ Il Policlinico, Oct. 15, 1899.

⁶ Physician and Surgeon, Oct., 1899.

the pleural cavity and pressed one of the towels into the liver wound, leaving the wound open, but dressing it antiseptically. On the third day the towels were removed, and the patient went on to an uninterrupted convalescence.

Frederick Treves¹ in a clinical lecture discussed elaborately **ptosis of the liver and the floating lobe**. He analyzed the definitions which had been given of the condition, pointed out the means by which the liver is suspended, called attention to the manner of the downfall and deformity of the liver, the cause of the prolapse, the symptoms, and the methods of examination. He then considered the evidences of a floating lobe. He said that the medicinal treatment of ptosis of the liver consisted simply in the treatment of the symptoms. In ptosis of the entire liver a well-made belt is of considerable service. The treatment by operation must be considered as applied to the floating lobe, and to ptosis of the entire liver. The floating lobe has been excised. The lobe has been sutured to the anterior abdominal wall. The distended gall-bladder, with which the floating lobe is often associated, has been treated by cholecystotomy. The operative treatment of ptosis of the whole liver consists in anchoring the organ in place by various methods of suturing, the operation being known as hepatopexy. Marchant sutures the anterior border of the liver to the costal margin with silk, and Langenbuch employs the same method. Richelot uses catgut sutures. In 1895 Treves fastened a prolapsed liver in place by 3 silk sutures, the median one of which took hold of the round ligament. The stitches were passed through the fibrous structures by the side of the xiphoid cartilage. Lanelongue exposes the convex surface of the liver over a space 6 cm. by 3 cm., and fastens the organ to the anterior abdominal wall by 3 catgut sutures. Péan opens the abdomen by a transverse incision, and by means of silk and catgut sutures unites the peritoneum of the anterior abdominal wall to the peritoneum of the posterolateral wall below the replaced liver. Legue suspends the liver by a double thread, which passes through the gland. Francke sutures the liver to the anterior abdominal wall, but places no sutures in the region of the gall-bladder. In the gap thus left iodoform gauze is introduced between the liver and the diaphragm, and is left in place for 8 or 9 days. Depage fastens the liver by sutures and also dissects up skin flaps from the front of the abdomen in order to reconstruct the abdominal wall. Terrier and Auvray collected 15 of these operations; 11 of them were cured, 2 died, and in 2 cases the result was uncertain. Treves thinks that as far as the surgical management of the floating lobe goes, nothing should be done beyond treating the distended gall-bladder, for cholecystotomy has been followed by complete cure and the disappearance of the floating lobe. It is unjustifiable to suture the floating lobe to the parietes or to excise the lobe. In complete ptosis much may be done by employing careful and substantial support by a thin metal plate, which takes a bearing from a pelvic band. Very few cases require operation. A few isolated sutures of silk or catgut will not support a very heavy organ like the

¹ Lancet, May 12, 1900.

liver. Only in extreme cases is operation needed. The best operation is probably that of Francke. The sutures should be of silk and should be passed well into the liver. The incision should be in the right semi-lunar line and the patient should be kept in bed from 4 to 6 weeks.

W. W. Keen¹ reported the case of a man 50 years of age in whom he successfully **resected a carcinoma of the liver**. The carcinoma was discovered by an exploratory operation. The tumor occupied the entire left lobe of the liver and could be drawn outside of the abdomen. The extirpation was performed with the cautery, and it required from 20 to 30 minutes to remove the lobe. The hemorrhage was not very great, except when some large veins were entered. When a large vein was opened by the cautery, it was at once pressed upon with the left forefinger, a catgut ligature was passed under it by means of a Hagedorn needle, and the ligature was tied slowly but firmly. Five ligatures were employed, and in 3 of the veins both ends required a ligature. It is probable that about 8 to 10 ounces of blood were lost. After the removal of the tumor the area of raw surface was lessened by folding the edge of the liver upon itself, as the cautery incision had been made obliquely, and the flaps were sutured with catgut. A considerable burnt area, however, was uncovered, and iodoform gauze was packed around this and allowed to emerge from the abdominal cavity. The tumor was $5\frac{1}{2}$ inches long, $4\frac{1}{4}$ inches wide, and 3 inches thick. [As long ago as 1888 Garré removed a hepatic cancer which was secondary to cancer of the gall-bladder. Hochenegg did a like operation in 1899. Bruns operated even before Garré. Keen's case was a primary malignant growth.]

Brenner² reviews the literature of **cancer of the common bile-duct** and reports 2 cases. In one of these cases a cholecystotomy had been performed because it was suspected that gall-stones existed. A number of stones were removed from the bladder and some from the cystic duct, and a cancerous gland was removed from close by the duodenum; other glands could be felt. This operation was performed by Jordan, of Heidelberg. He removed a portion of the gall-bladder wall and fastened the edges of the gall-bladder wound to the abdominal wound. Some weeks after this operation he performed cholecystenterostomy, because there was so copious a flow of bile and mucus from the fistula. In performing this operation an abscess cavity was opened, and it became necessary to drain this with gauze. Later another operation was performed to close the fistula. In doing this, an opening was torn in the intestine, and this opening was fastened to the dilated bile-duct. A mass could be felt which was supposed to be due to cancer of the pancreas or pylorus. Death occurred from fecal extravasation. The tumor which was supposed to be pancreatic or pyloric was found to be a greatly dilated common duct containing a cauliflower-like mass of cancer. In the second case reported by the author the patient had suffered for a considerable time from what was looked upon as gall-stone colic. Subsequently he developed marked jaundice, and it was thought that he might have a cancer of the liver. The operation of cholecystenterostomy was

¹ Med. Rec., Oct. 7, 1899.

² Virchow's Archiv, vol. CLVIII, Part 2, Nov., 1899.

done and a mass was found which was thought to be cancer of the stomach. The patient died on the fifth day, and it was found that he had suffered from primary cancer of the common duct.

W. S. Halsted¹ contributes an article on the **surgery of the bile-passages**, especially of the common duct. He is greatly impressed with the excellent results of operation for gall-stones in the common duct. What nature accomplishes without the surgeon's aid in attempting to rid herself of obstruction in the gall-passages and to repair the damage is marvelous, but her methods are crude and attended with great suffering and danger. Halsted, however, has in mind and reports 2 particularly creditable examples of nature's surgery. It is equally wonderful how nature destroys all traces of her surgical handiwork. Halsted operated on 2 cases in which perforation of the gall-passages and intestinal walls and expulsion of the stone had undoubtedly occurred, but in one of them he was unable to find any evidence of the perforation other than a few light and easily separable adhesions. The most noteworthy incidents observed by Halsted in this department of surgery may be summarized as follows: (1) Dilation of the first part of the duodenum caused by constricting adhesions, as the result, it may be, of the dilation of an ulcer on the confines of the pylorus. This ulcer gave rise to a chronic dissecting submucous abscess. The abscess was punctured during operation and a fatal peritonitis resulted. (2) Primary carcinoma of the duodenal papillæ and diverticulum of Vater. In the first operation he excised nearly the entire circumference of the duodenum and portions of the pancreas, of the common duct, and of the pancreatic duct in the line of this suture. A second operation was subsequently performed: viz., cholecyst-cystico-enterostomy. (3) Dynamic dilation of the first portion of the duodenum and of the pyloric portion of the stomach, corresponding to the limits of a sharply circumscribed peritonitis, gall-stones in the gall-bladder, and hydrops vesicæ. (4) Conditions in which the common and cystic ducts were reduced to fibrous cords, dilated hepatic ducts and gall-bladders existing. Toxic symptoms, renal colic resembling intestinal colic, and anuria. Colic and anuria relieved by saline infusion. (5) Choledocotomy performed twice. The gall-bladder, which was shriveled at the first operation, when there were probably 2 stones in the common duct, was large and distended at the second operation, when only 1 stone occupied the common duct. (6) The most dense of adhesions, a small abscess in the midst of the adhesions, the muscular coat of the duodenum converted into fibrous tissue, and the exposed submucous tissue so closely resembling gall-bladder that the duodenum was aspirated and opened. (7) Cases illustrating the rapidity with which adhesions can be absorbed after perforation and extrusion of stone. (8) Discharge of pus and blood by mouth and rectum during severe gall-stone attack. Two years later the adhesions were so dense and extensive that the common duct was reached by a retroperitoneal route over the right kidney. A stone in the ampulla had just ulcerated through the wall of the common duct and through its duodenal coverings.

¹ Boston M. and S. Jour., Dec. 28, 1899.

Joseph Ransohoff¹ writes on **gall-stones**, with a consideration of their etiology, diagnosis, and operative treatment. In conclusion he submits the following propositions: (1) The gall-stones found in a gall-bladder are generally formed at about one and the same time, and recurrence will not follow removal unless reinfection of the biliary passages recurs. (2) Cholecystotomy with drainage is the normal operation. (3) Save in exceptional cases the work should be completed at one operation. (4) Ideal cholecystotomy is not recommended. (5) Cholecystectomy is rarely required in acute processes. It is more dangerous than cholecystotomy, and should be reserved for chronic cases in which the gall-bladder can not again become normal. (6) Cysticotomy is a safe addition to incision of the gall-bladder in stones of the cystic duct. (7) Choledochotomy with suture and drainage should be the routine procedure in common-duct stones. It will rarely be necessary to incise the duct through the duodenum or through the loin.

Reynier² is an advocate of the operation of **choledochotomy without suture**. He says that it is not necessary to apply sutures to such wounds. All that is necessary is to wall off the peritoneal cavity with gauze and to use good drainage.

Lejars³ discusses the subject of **operation in calculous cholecystitis**. He says that in inflammations of the gall-bladder in which calculi are present there are 3 forms of the disease. In the first the gall-bladder is distended with clear fluid and a solitary stone is impacted in the neck of the bladder or in the cystic duct. In one of Lejars' cases the stone was not discovered at the time of operation, but was found 3 weeks later on the dressings, having been discharged through the fistula. In the second variety of cases the bladder contains numbers of calculi. In the third variety the gall-bladder is shrunken and thick, and contains a large calculus or a few small calculi. The first group of cases is treated by cholecystotomy; the second group, either by cholecystotomy or cholecystectomy; and the third, by cholecystostomy with prolonged drainage.

William J. Mayo,⁴ in some observations on the **surgery of the gall-bladder and the bile-ducts**, reviews 105 operations performed in St. Mary's Hospital, Rochester, Minn. Cholecystotomy was performed 64 times for gall-stones in the gall-bladder or cystic duct, or both. One of these patients died. In 4 of the 64 cases a secondary operation was necessary—2 for the removal of gall-stones not found at the time of the primary operation, 1 for the relief of biliary fistula, and the fourth for a cystic accumulation due to stricture in the cystic duct. Three other cases had some trouble after the fistula healed, because the cystic duct did not satisfactorily drain the gall-bladder. In 2 of these the wound reopened several times and discharged retained secretions. Cholecystotomy for the relief of infections of the gall-bladder, the ducts, or both, was performed 8 times with 1 death. Two cases of infective cholangitis were operated upon, and both recovered. In all cases in which cholecystotomy failed to cure there was obstruction to drainage through

¹ Jour. Am. Med. Assoc., Sept. 16, 1899.

² Rev. de chir., Nov., 1899.

³ Rev. de chir., Nov., 1899.

⁴ Ann. of Surg., Oct., 1899.

the cystic duct. The obstruction was usually produced by a stricture due to ulceration in the duct, the ulceration having been caused by the prolonged retention of a stone, or, as Christian Fenger shows, through angulation of the duct. In such cases the mucous membrane continues to secrete, force is required to drive the secretions past the obstruction, and the passage causes colic. Mayo agrees with Harris that if a small gall-bladder is firmly contracted on stones, there is great liability to attacks of regional peritonitis. In such a case, after external drainage has been removed, the thick walls of the bladder continue to contract, and drainage through the ducts is interfered with from islands of mucous membrane not previously destroyed. In many respects this condition resembles chronic appendicitis. In such cases—in fact, in all cases in which a stricture is present in the cystic duct—cholecystectomy should be performed. Cholecystectomy was performed 4 times and all recovered. In 1 case it was the primary operation for acute gangrenous inflammation of the gall-bladder. It was performed once for biliary fistula and twice for recurrent cholecystitis. Choledocotomy was performed for stones in the common duct 11 times without a death. Cholecystenterostomy was performed once with the Murphy button for a stricture of the common duct, and the patient recovered. In 3 cases the gall-bladder was adherent to adjacent viscera, and as a result there were pain and gastric symptoms. Liberation of the adhesions relieved the symptoms. In 7 cases an exploratory incision was negative, no gall-stones having been found. In 2 of these, appendicitis was the source of the trouble, in another a crisis from a movable kidney, and in 4 the cause of the symptoms was not found. This gives 98 operations and explorations for nonmalignant disease, with a mortality of 2. Seven operations were performed for malignant disease: 4 cholecystotomies, 2 exploratory incisions, and 1 cholecystenterostomy. In this series there were 3 deaths. These results prove that in the majority of cases of malignant disease of the biliary apparatus operation is contraindicated. Mayo used to employ the straight incision of Tait, through the rectus or at its outer margin, but he now employs the incision of Bevan, because it affords more room and can be easily closed. He is opposed to the so-called ideal operation of cholecystotomy with immediate suture. This operation does not furnish drainage for the treatment of the accompanying cholecystitis, and hence it will be more than likely to be followed in the future by stone formation. The normal position of the gall-bladder makes the fundus dependent; hence, if infection exists with a sluggish bile current, sediment is deposited in the fundus and stone is easily formed. Occasionally cases of typical colic in which stone is not found are due to the occasional emptying by muscular contraction of a gall-bladder containing sediment or mucus. When the fundus of the gall-bladder is sutured into the external wound, the altered position brings the cystic duct more nearly at the bottom, so that the mechanical conditions tend to prevent the separation of sediment and the formation of stone. Those cases of cholecystotomy in which all stones have been removed and the ducts are free have no further trouble, because the fixation and elevation

of the fundus makes the cystic duct the most dependent part, and gravity thoroughly drains the gall-bladder through the cystic duct. It is a common experience to find a contracted gall-bladder deep under the liver, which it is impossible to suture into the wound. In such a case the following method of draining is very useful: Two or more long sutures of fine catgut are passed through the walls of the gall-bladder below the opening. A well, built of gauze strips 2 inches wide, is formed by passing the gauze just outside of the gall-bladder and tying it in place with the catgut sutures. The side of a rubber drain is caught at a little distance from its extremity by one of the threads of catgut on a needle, and the tube is passed into the gall-bladder and tied in place. This anchors the drains in position and prevents displacement. The external incision is partly closed in the usual manner. The time of draining the gall-bladder varies with the case. If it is certain that all stones have been removed and that the walls are neither adherent nor greatly thickened, and if the bile flows freely at once, 3 or 4 days will be sufficient; but if there have been many small stones or considerable fragmentation of soft ones, a quantity of bile-sand, or evidences of protracted inflammation, one or more weeks are necessary. The gall-bladder should not be sutured to the lower angle of the incision, for this position will not properly elevate the fundus. It should be sutured at the upper angle of the incision. Of the 11 cases in which stones were removed from the common duct, the duct was sutured in 4, and in 2 of these there was no leakage. In the other case drainage was employed without suture. The stone is isolated, the duct is held between the finger and thumb, and by alternately pressing and relaxing the strain the duct-wall veins can be ligated as they fill up and can be avoided in the incision. A longitudinal incision is made and the stone caused to present. The suggestion of Elliott is valuable: *i. e.*, use the stone like a stocking-ball, by placing a lateral suture of catgut at each side of the opening. The stone is then removed and a search is made for others. A strip of gauze 2 inches wide is carried down each side of the opening and tied in place by the catgut. The edges of the incised duct are approximated with tissue forceps and covered with several thicknesses of gauze, and a rubber tube is passed into the gauze well, and fastened by one of the catgut threads; in order to prevent tension, the gall-bladder is opened and drained in the usual manner. Suture is unnecessary. It requires a large incision, considerable time, much separation of adhesions, and protracted manipulation, and these cases are jaundiced, bleed easily, and stand operation very badly. Mayo agrees with Davis that suture is harmful by preventing adequate drainage of the infected duct. Cholecystectomy should be performed more frequently than it is. It is often required as a secondary operation after the drainage of an infected gall-bladder or after failure of cholecystotomy to cure. Considering that the mucous membrane is the only part of the gall-bladder which gives rise to after-trouble, Mayo has in 3 cases opened the gall-bladder, removed the mucous membrane to the cystic duct at this point, cut it across, ligated bleeding points,

and left the duct open. He sutured the muscular and peritoneal coats into the incision and established drainage in the usual manner. In this operation the essential cause of the trouble has been removed as thoroughly as by cholecystectomy.

Charles L. Scudder¹ reports a case of **acute hemorrhagic gangrenous pancreatitis**, which was operated upon. The patient was a man of 34 who had been drinking heavily for 3 weeks. Early one morning he was awakened by violent pain in the epigastric region, and he had several attacks of vomiting. The symptoms continued for 2 days, when he was taken into the hospital. At this time he had the usual peritonitis fascies, and every few minutes he vomited a small amount of dark fluid containing some bile and free from fecal odor. There had been no defecation for 3 days. The temperature was 99.8° F. and the pulse was 130. The abdomen was uniformly distended, but not rigid. There was dullness in each flank. Nothing unusual was disclosed in the epigastric region. There were no external signs of hernia and no leukocytosis. The abdomen was opened at the outer border of the rectus, and dark, coffee-colored fluid escaped from the general peritoneal cavity. The mesentery and great omentum showed numerous small yellow areas of disseminated fat necrosis. Soft adhesions encapsulating dark-colored fluid were found about the pancreas and duodenum. The gall-bladder seemed normal. The pancreas was slightly enlarged. All adhesions were broken down, the abdominal cavity was thoroughly flushed with salt solution, gauze wicks were carried down to the pancreas for drainage, and the abdominal wound was partly closed. At the end of 5 days all acute symptoms had disappeared. Twelve days after operation there was a sudden rise of temperature, nausea, vomiting, and leukocytosis. Rectal feeding was now used. During the following 2 weeks the man was evidently septic, and 4 weeks after the first operation the abdomen was opened a second time and a deep abscess cavity was found about the pancreas. The cavity was evacuated and cleansed; and a dry sponge introduced upon long forceps and twisted about removed a black, gangrenous mass, which was the greater part of the pancreas. There was considerable oozing of blood, which was checked by gauze packing. The man died in 2 days and no autopsy was obtained. At no time during the progress of this case was there sugar in the urine. The fluid evacuated at the first operation was sterile. The material evacuated at the second operation contained the staphylococcus pyogenes aureus. The symptoms in this case suggested some form of intestinal obstruction, but the collapse was less acute and less early than is usually seen in intestinal obstruction. The pain was not colicky, as in intestinal obstruction; it was a continuous oppression in the epigastric region. The vomiting began early and was continuous, as in intestinal obstruction, but, unlike that condition, was not copious in amount. Constipation was present.

Anders² makes a study of **pancreatic hemorrhage**, and has col-

¹ Boston M. and S. Jour., Nov. 16, 1899.

² Jour. Am. Med. Assoc., Dec. 2, 1899.

lected the references of 40 cases; 25 of these were males and 9 were females, and of the remainder the sex was not mentioned in the reports. Almost 50 % of the patients were between the ages of 40 and 50 years. Death in most of the cases took place within a few hours, and very rarely did the patient live as long as 3 days after the hemorrhage. The cause of death is uncertain. It can not be due to the amount of hemorrhage, for in one case the patient died when only 8 ounces of blood had been lost. Some think that it is produced by pressure upon the sympathetic plexus, and others that it is due to shock.

McArthur¹ has collected the reports of 104 cases of **pancreatic cyst** subjected to operation. He divides these cysts into retention-cysts, cystic sarcomas, and cystic adenomas. Retention-cysts arise in the same manner as does a ranula in the mouth. A blood-clot or a fragment of stone obstructs the main duct or a branch of the duct. The best operation is drainage in two steps; but such an operation requires a prolonged convalescence, and a fistula may follow it. There is, however, far less shock and much less hemorrhage than when extirpation is attempted. It is only in the retention-cysts that drainage is to be employed as the curative treatment; in other cysts extirpation should be resorted to.

L. L. McArthur² reports a case of **acute fat necrosis** in which operation was followed by recovery. This case is of particular interest because acute fat necrosis has been regarded as invariably fatal. The patient was a young woman who had been suddenly seized with a violent abdominal pain and was brought into the hospital in a state of profound collapse. The symptoms resembled those of hemorrhage, and fluid could be detected by percussion when the position was changed. It was difficult to decide whether the fluid arose from the rupture of an appendicial abscess, rupture of a gall-bladder, ulceration from stone, or extravasation from perforation of the stomach. The pulse was very feeble, the temperature was subnormal, and the patient was unable to give a history. The abdomen was opened and was found to contain a large quantity of dark fluid tinged by blood, and fluid was oozing from the lesser peritoneal cavity through a small opening in the omentum. This opening was enlarged and about 1½ pints of fluid escaped. The mesentery of the intestine showed areas of acute fat necrosis. These areas were sharply defined, yellowish-white, and looked like plastic lymph; but when the finger was placed on one of them, it was found to be beneath the peritoneum. The diagnosis now became clear; it was that a pseudocyst of the pancreas had emptied into the peritoneal pouch. The lesser peritoneal pouch was widely opened and packed with a Mikulicz drain. The abdominal cavity was flushed with salt solution, a glass tube was passed down into the lower portion of the pelvis, and the abdominal wound was left open. The patient lingered between life and death for 5 or 6 weeks, gangrenous tissue coming away through the open wound, and eventually recovered. The fluid contained a ferment which, acting on starch, would then reduce the sugar test solution. [This case is ex-

¹ Jour. Am. Med. Assoc., Dec. 2, 1899.

² Chicago Med. Recorder, Oct., 1899.

tremely important, and proves that it is occasionally possible to benefit even such apparently hopeless cases by operation.]

Burtz¹ states that the **mortality of splenectomy** has been lessened in recent years. This is due to asepsis, to improved technic, and to proper restriction regarding the cases which are operable. The prognosis is fairly good for operation in ruptured spleen. The prognosis in malignant tumor and in wandering spleen is not very good. Operation is not proper in malignant disease if there are extensive adhesions. Leukemia contraindicates operation. Spanton's figures show that in 25 cases of splenectomy for leukemic spleen there were 24 deaths. In leukemia cases the ligature which is applied to the pedicle cuts through the brittle and readily lacerable vessels, and a secondary hemorrhage almost invariably occurs.

George Heaton,² in discussing **splenectomy for ruptured spleen**, reaches the following conclusions: (1) Immediately after the removal of the spleen leukocytosis arises. It declines gradually, but lasts for 6 months or even more. (2) All forms of leukocytes are increased, but the proportions that they bear to one another are not the same as exist in healthy blood. (3) The anemia which follows is recovered from but slowly. (4) In almost half of the cases in from 10 days to 3 weeks after the removal of the spleen, pyrexia, wasting, weakness, anemia, thirst, headache, and rapid pulse arise, and these symptoms pass away slowly. (5) The lymphatic glands enlarge and in some cases hypertrophy to a very great degree.

A new method of **excision of the rectum for cancer** is detailed by Thomas Carwardine.³ In one of the author's cases the sacrum was restored and a new bony coccyx grew from the periosteum, the sphincter being attached to the extremities of the new bone. A purely liquid diet is employed for several days before operation. If the growth is high up and it is necessary to open the peritoneum, a preliminary colostomy is performed. The patient is placed in an inverted Trendelenburg position, and subperiosteal excision of the coccyx and of the fourth and fifth pieces of the sacrum is performed. (Fig. 26.) Median proctotomy is next done by passing a long slender knife into the anus, transfixing the tissues above, and dividing in the middle line. (Fig. 27.) Isolation of the gut below and on either side is accomplished by cutting the bowel transversely below the growth, leaving the mucous membrane over the sphincter intact if possible. (Fig. 28.) Isolation of the gut above, with the presacral tissue and glands in continuity, is the next and most important step. The mucous membrane at least an inch above the growth is divided transversely, which exposes the perirectal tissue and presacral glands. The presacral tissues are removed from the periosteum up to the level of the hollow of the sacrum, the peritoneum being pressed out of the way. (Fig. 29.) This is accomplished readily with the finger; but if the peritoneum is involved, the diseased portion should be cut away and sutured. (Fig. 30.) A mass may now be isolated consisting of the tumor

¹ Dent. med. Woch., Nov. 2, 1899.

² Brit. Med. Jour., Aug. 19, 1899.

³ Brit. Med. Jour., Oct. 29, 1899.

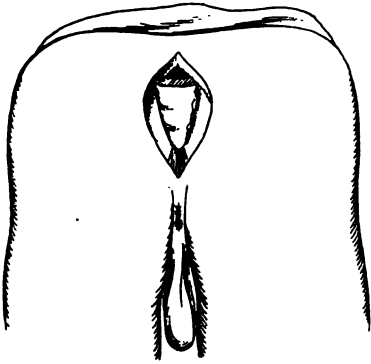


Fig. 26.—The coccyx and part of the sacrum have been excised subperiosteally.

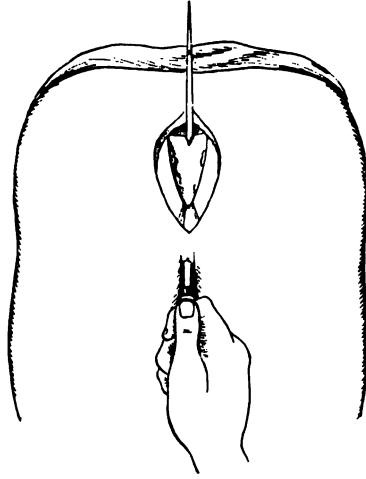


Fig. 27.—Median transfixion.

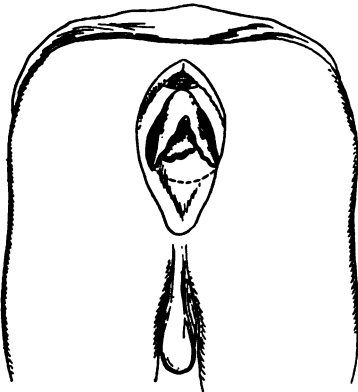


Fig. 28.—Rectum and growth exposed.

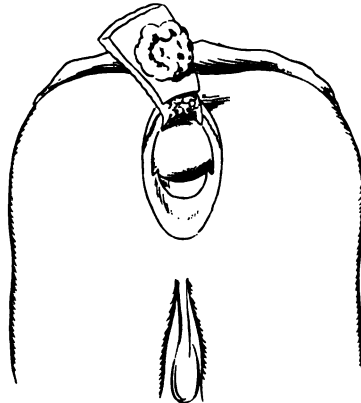


Fig. 29.—Rectum and growth isolated in continuity with presacral tissue.

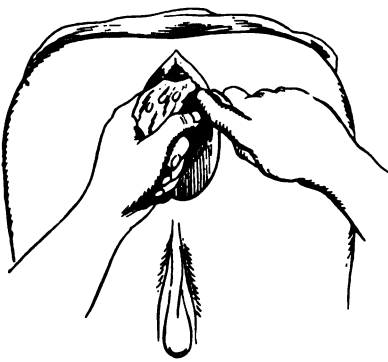


Fig. 30.—Separating the peritoneum from the presacral tissue.



Fig. 31.—Diagram of parts removed, the presacral tissue having been divided high up in the hollow of sacrum.

Figs. 26-34.—A new method of excision of the rectum for cancer (Carwardine, in Brit. Med. Jour., Oct. 28, 1899).

and presacral glands. The presacral tissues are divided transversely as high up as necessary, which effectually removes the entire lymphatic area involved, and is one of the features of the author's method. The gut is now united above and below with silkworm-gut (Fig. 32), with excellent results in the writer's experience. The wound heals readily, the feces coming away by the colostomy opening, and the stitches are removed on the ninth day. The final results are represented diagrammatically. There is a corrugated, contractile anus, a bifid, bony tail, and the lateral

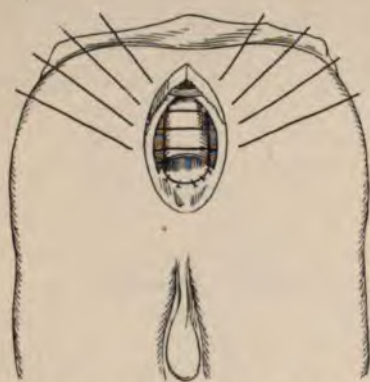


Fig. 32.—Method of uniting the gut and the soft parts.

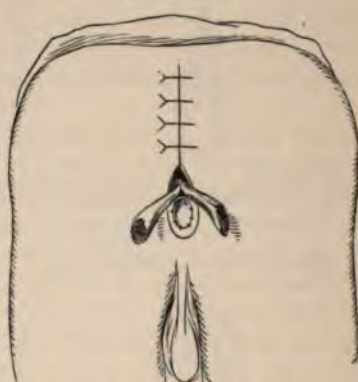


Fig. 33.—The wound closed and drained.

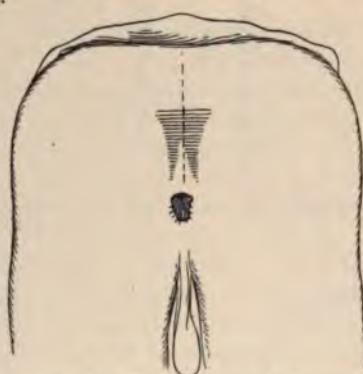


Fig. 34.—The final result, represented diagrammatically.

Figs. 26-34.—A new method of excision of the rectum for cancer (Carwardine, in *Brit. Med. Jour.*, Oct. 28, 1899).

sphincters are held posteriorly by a thick band of tissue. (Fig. 34.) In the after-treatment the gauze drain is soon removed and irrigation with weak iodine solution is carried out through the colostomy opening, thus flushing out the segment of gut. J. Greig Smith's method has been used to close the colostomy wound. [In this method the presacral glands are removed, which seems a valuable improvement, and further the attachments of the sphincter are preserved. Carwardine's results have been excellent, and the method seems to be an entirely reasonable and a promising procedure.]

C. G. Cumston,¹ in a paper on **prolapse of the rectum in children**, states that the tumor varies in outline, the most usual form being sausage-shaped, although it may be conical, globular, or pear-shaped. It is coated with mucous membrane. A sulcus is usually found between the anal skin and the mucous membrane of the prolapsed gut. The peritoneum may be included in the tumor, for this membrane covers the anterior and lateral surfaces of the rectum, is attached to the third sacral vertebra, descends along the lateral surfaces, extends anteriorly, and is separated from the gut in a curved line, which forms a curve like a horseshoe, the concavity being backward and upward, and it extends a reflected part on the bladder in the male and on the uterus in the female. As the extraperitoneal part of the rectum is about 7 cm. above the anus, the prolapse must be considerable to include the attached serous membrane. The possibility of the presence of the small intestine should also be considered. A gurgling sound when the tumor is reduced by digital manœuvres is accepted as a pathognomonic sign of this condition. The writer thinks that, among other causes, infection is one of the most important, especially in young children. In adults, polypi, ulcers, piles, or other rectal lesions are often the etiologic factor. The prolapse may be either chronic or acute; in the latter variety the rectum will be found edematous, cold, and with hemorrhagic foci, and the prolapse will be accompanied by nausea, fever, or collapse. In complete prolapse it will be found that the thickness of the tissues is greater than normal, they have more resistance, and can not be made to move over each other so easily as in two invaginated intestinal cylinders. The presence of the sulcus is also important, as it is never found when the mucous membrane alone is prolapsed. The height of the invagination will also determine the presence or absence of the peritoneum in the anterior culdesac. Reduction should be done at once to determine if there is strangulation. Three severe cases requiring extensive operation are reported. In the first case longitudinal lines, destroying only the mucous membrane, were made with a cautery. As this failed, the tumor was excised. In the third case there was complete prolapse. In operating the technic of Mikulicz is preferred by the writer, who first cuts through the outer tube of the intestine, layer by layer. The pouch of the peritoneum is examined for small intestine as soon as opened, and then closed by a running suture. The anterior aspect of the internal intestinal tube is cut through, little by little, and united by deep silk sutures to the other cut portion. The posterior part is treated in the same way. Packing of the rectum is advised against. The sutures are covered with iodoform and iodoform gauze, next with wood-wool, the dressings being changed daily or oftener. Daily irrigation with boric acid solution should be employed and the bowels should be kept closed with opium for a week. The author is opposed to the use of the rubber tube for producing artificial anemia. If greater support is required, a triangular piece of skin and mucous membrane should be removed from the posterior part of the anus. Colopexy, as done by Jeannel, consists

¹ Ann. of Surg., Mar., 1900.

in anchoring the gut to the abdominal wall by sutures. An incision is made near Poupart's ligament and an artificial anus created, which is afterward closed. The writer is opposed to this on account of the length of time required for cure and because of the inconvenience to the patient. Finally, all cases of prolapsed rectum should be treated at once—first medicinally after reduction, and by resection if milder measures fail.

James R. Wallace,¹ of Calcutta, reports a case of a **neglected stitch in Whitehead's operation for piles** resulting in a painful **fistula** simulating epithelioma. On admission to the hospital a fungating mass with a narrow pedicle was found about $\frac{1}{4}$ of an inch from the anal margin. This was removed under an anesthetic and a fistula extending $1\frac{1}{2}$ inches into the rectum was disclosed. This was divided and a stitch found, which had been the source of the trouble. Recovery followed.

Three cases of **perineal resection of the rectum for carcinoma** are reported by Halstead,² of Chicago. In cases of rectal growths which begin low down and extend above the level of the third sacral vertebra the attack should be made by either the abdominal or the sacral route; but in cases where the growth is below the peritoneum the perineal method may be used, with the advantage of lowered mortality, the figures being, by the sacral route, 18.7% of deaths and 10% of cures, under the 3-year rule. In the perineal operation there is a mortality of 18% and there are 14.8% of cures. The author therefore concludes that as the perineal method is easier, the mortality less, and the functional results better, it is the preferable one. If the levator ani muscles are sutured to the stump, tolerable control of the bowel is secured, although there is necessarily some loss of sphincter action after excision of the rectum.

Leonard A. Bidwell³ stated that his **method of attaching the mucous membrane to the skin after perineal excision of the rectum** had in his hands been very satisfactory. After excision of the rectum by the racket-shaped incision around the anus, make 2 transverse incisions, 2 inches long, on each side of the original cut, 1 inch apart. The flaps are dissected up and stitched to the rectum. If there is any tension, a longitudinal cut is made in the posterior surface of the rectum and the wound is plugged in its posterior part. The author has used a similar method in suprapubic operations, and for permanent fistula in tracheotomy, with excellent results.

In some **practical notes on diseases of the rectum** Adler⁴ urges that any suppurative process in the neighborhood of the rectum should be opened freely as soon as the diagnosis is made. Free drainage should be provided. In cases of fistula a stricture of the rectum should always be looked for, and a digital examination should be made to exclude this possible cause. When there is phthisis pulmonalis, the indications are for operation, unless the phthisical process is active. The author does not always use a general anesthetic in fistula cases, as he

¹ Dublin J. M. Sc., Mar., 1900.

² Brit. Med. Jour., Oct. 21, 1899.

³ Chicago Med. Recorder, Dec., 1899.

⁴ N. Y. Med. Jour., Dec. 30, 1899.

has found that a 2% to 4% solution of cocain is often satisfactory. In examination of the rectum benign neoplasms are frequently overlooked, because the examining finger pushes them away; but if the finger is brought from the sound side downward toward the suspected side, the growth will be caught.

An operation for the removal of malignant disease of the rectum is suggested by Ellis¹ to which he gives the name **abdominoperineal proctosigmoidectomy**. An abdominal incision is made, and the internal iliac arteries are found at the last lumbar vertebra. Each artery is tied, the peritoneal covering having been divided and the ureters avoided. If necessary, the sigmoid flexure is freed from the inferior mesenteric artery, and the bowel is tied above the growth with gauze in 2 places, after which it is clamped and divided. Sterile gauze is then placed over the cut ends, and the rectum freed as far as practicable. The bowel is then replaced in the pelvis and held by sterile compresses and the abdomen is closed. A left iliac colostomy is then performed and the patient is put in the lithotomy position. After plugging the anus an elliptical incision is made around it and the anterior surface of the rectum is freed from the vesical triangle. The rectum is now brought through the wound, as well as the compresses, and the cavity is packed and allowed to close from above. The author does not claim this as an original method, but rather a combination of the best parts of the operations of Quénu, Hochenegg, Doyen, von Bergmann, and Allingham.

It is claimed by the elder Senn² that **high rectal carcinoma** may be **excised without sacral resection**. He states that he has resected the carcinomatous rectum by the sacral route in about 30 cases, doing either a typical Kraske operation or total resection of the last 2 sacral vertebrae. He is now convinced that this operation not only does not gain enough space to justify the risk, but is absolutely harmful. A preliminary removal of the coccyx meets all the indications, gives sufficient room in extirpating the rectum high up, while in cases occurring below the peritoneal reflection even this procedure is unnecessary. In removing the rectum high up it is necessary to open freely the peritoneal cavity, and in cases where the removal of the coccyx does not afford enough room, the combined operation is much safer than sacral resection. Two cases are reported, each having been operated on more than 2 years ago, one being a case of carcinoma of the lower rectum, involving the sphincters, in which it was necessary to establish a sacral anus. The other growth had a high origin. The author considers radical operations contraindicated in all cases in which the proximal limits of the growth are beyond the reach of the index-finger, and that "the combined operation is destined to take the place of sacral resection in all cases in which excision of the coccyx does not afford the required space to reach the proximal limits of the disease with safety."

Wm. V. Laws³ describes a **pneumatic sigmoidoscope**, which consists of tubes of varying lengths and diameters, fitted with a screw-cap

¹ Atlanta Jour.-Rec. of Med., Aug., 1899.

² Phila. Med. Jour., Sept. 30, 1899.

³ Phila. Med. Jour., Jan. 20, 1900,

of glass; the proximal end having an electric light bulb. After introduction into the rectum the obturator is removed, the electric light is placed in position, the screw-cap is adjusted, and air is pumped into the tube, by means of which the upper rectum and the sigmoid are inflated. A wet cotton pad held close to the anus or an inflated pessary slipped over the tube will keep the air confined to the rectum. In examining the lower rectum a finger-cot over the end of the tube, held in place by a ring, becomes transparent when inflated, and renders examination easy.

Fig. 35.—Pneumatic sigmoidoscope: A, B, C, detachable tubes, 20 mm., 25 mm., and 30 mm. in diameter, 18 cm. long; D, hand-piece containing electrodes K; F, screw-cap, fitted with plate glass; G, double air-bulb; H, I, connection and cords of battery; E, extension obturator; 1, 2, 3, different size tips for obturator; J, 5-candle-power electric light (Laws, in Phila. Med. Jour., Jan. 20, 1900).

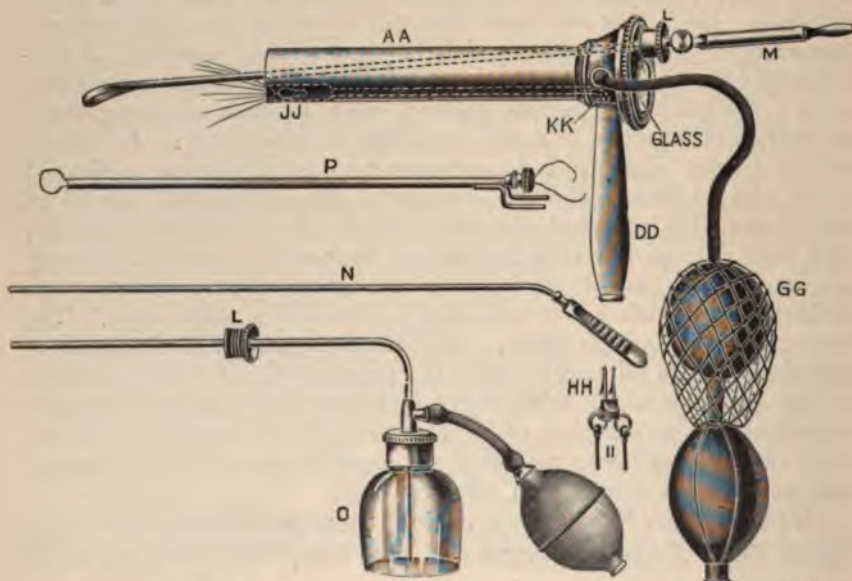


Fig. 36.—AA, tube, 30 mm. diameter, 18 cm. long; JJ and KK, electric lamp and electrodes; L, air-tight valve; DD, hand-piece; GG, air-bulbs; HH, electric connection; P, electric cautery snare; N, probe; M, curet; O, spray apparatus (Laws, in Phila. Med. Jour., Jan. 20, 1900).

In a paper on **rectal adenomata** Wm. M. Beach¹ calls attention to the fact that they rarely occur above the pelvic floor, while an adenocoele may occur anywhere in the rectum. Unless routine proctoscopy is practised the causative factors of pruritus ani, hemorrhoids, or procidentia may be overlooked. The author concludes his paper by saying that rectal adenomata contain the elements of the mucosa and submucosa, and are either hard or soft, benign or malignant. Early recognition is of the greatest importance.

At the first annual meeting of the American Proctologic Society, held at Columbus, O., June 6, 1899,² Mathews delivered an address on the **importance of giving rectal diseases special study**. Tuttle read a paper on pruritus ani, and stated that he was not a believer in essential pruritus. He believes the disease is dependent on constitutional and local conditions. Nitrogenous diet, alkaline diuretics, and salicylic compounds, with hot baths, compose the routine treatment, with local applications of chloral, black wash, cocain, etc., according to the variety and type of the disease. Earle reported a **modification of Whitehead's operation for piles**, which consists in clamping the tumors by sections, beginning anteriorly, where an incision is made to determine the depth. The whole anal circuit is treated by piecemeal and closed by continuous suture. Martin, of Cleveland, stated that **the act of defecation** is controlled in part by the rectal valves, which may act normally in preventing a too rapid descent of feces or may become an obstruction in abnormal conditions. Pennington spoke of the **post-operative treatment of hemorrhoids**. He uses a tampon made by taking a piece of rubber tube $4\frac{1}{2}$ inches long and $\frac{5}{8}$ of an inch in diameter, wrapping it with sterile gauze, and covering it with a special rubber covering, and introduces it through a speculum. Adhesion to the wound does not occur, and there is absence of pain during first act of defecation.

A. T. Cabot³ describes his method of **closure by buried sutures of rents implicating the anal sphincter**. It consists in freshening the sides of the perineum and laying bare the ends of the sphincter muscle. A row of catgut stitches is taken, which approximates the rectal wall, the stitches not entering the lumen of the bowel, but coming out on the mucous membrane edge. The last or external stitch includes the divided ends of the sphincter. A second row of buried catgut stitches is next taken, drawing together the divided pelvic fascia, levator ani, transverse perineal, and sphincter vaginae muscles. A third row of stitches is often necessary to accomplish this result. The vaginal mucous membrane is next closed. Emmet's purse-string suture is sometimes used as an additional means of consolidating the perineum. The writer prefers this method to that of Kelly, who uses silk, and inserts the stitches from the rectal side of the wound. Infection seldom follows the author's operation. A case is described in which Cabot removed the whole perineum and 4 inches of the rectovaginal septum for malig-

¹ Phila. Med. Jour., Dec. 16, 1899.

² Phila. Med. Jour., July 8, 1899.

³ Boston M. and S. Jour., Dec. 28, 1899.

nant growth, with excellent result, closing by his method of buried chromicized catgut sutures, using No. 1 gut.



Fig. 37.

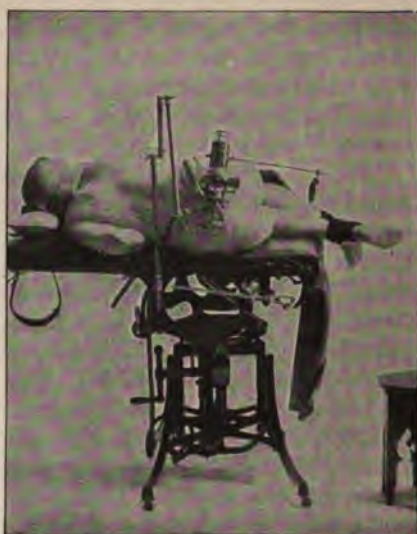


Fig. 38.



Fig. 39.



Fig. 40.

Figs. 37-42.—A new method for ballooning the rectum and for the removal of foreign bodies from the anus and rectum without anesthesia (Martin, in *Phila. Med. Jour.*, July 22, 1899).

In an analysis of 10 cases of **imperforate rectum**, in 9 of which colostomy was performed, W. P. Montgomery¹ concludes that the per-

¹ *Lancet*, Feb. 3, 1900.

ineal and iliac routes should be compared, both as operations for acute obstruction and as a means of permanent relief. The perineal method is a very difficult one by which to find the gut, for in Curling's tables it was missed in 23 cases out of 57; Owen found it in 1 case out of 5; and in the author's series it was found only twice in 6 cases. In addition to this, the obstruction is often in the cecum, as was the case in 2 of the writer's series. A consideration of these facts, and a careful postmortem examination of the fatal cases in the reported series, leads the writer to prefer performing colostomy as a routine procedure. From the view-point of permanent relief, a study of Curling's 26 cases shows that 5 lived long enough to be called cures, but the author could call only 1 case a real success. Children who have had the perineal operation require almost constant care to prevent stricture. Walford reports a case of death at 17 years from ulceration and perforation of the sigmoid, following a perineal operation shortly after birth, so that if more than $\frac{1}{2}$ of an inch separates the rectal pouch from the surface, a perineal anus will be a constant source of trouble. The author therefore concludes that on most accounts immediate colostomy is preferable.

Thos. Chas. Martin,¹ of Cleveland, presents a pictorial demonstration of a new method for ballooning the rectum and for the removal of foreign bodies from the anus and rectum without anesthesia. (Figs. 37-42.)

¹ Phila. Med. Jour., July 22, 1899.



Fig. 41.



Fig. 42.

Figs. 37-42.—A new method for ballooning the rectum and for the removal of foreign bodies from the anus and rectum without anesthesia (Martin, in Phila. Med. Jour., July 22, 1899).

DISEASES OF THE RESPIRATORY ORGANS.

Robert G. Le Conte ¹ writes on the control of hemorrhage in penetrating wounds of the chest. He says that the hemorrhage may be from three sources: (1) from the lung; (2) from an intercostal vessel; (3) from the internal mammary artery; or from any combination of these. The position of the wound will probably indicate whether the intercostal or the internal mammary vessels have been divided. When such an accident happens, the vessels retract very soon, and consequently there is no characteristic arterial spurt from the wound. If the wound extends within $\frac{1}{2}$ of an inch of the border of the sternum, the internal mammary vessel is probably wounded. The hemorrhage may be arrested by a tampon or by ligation. In order to tampon, push the center of a square piece of gauze through the wound and fill it with strips of gauze. Then draw the whole mass forcibly outward and fasten it so that firm pressure will be brought to bear upon the inner wall of the thorax and the 2 corresponding ribs. An extension of the wound parallel with the ribs may permit of ligation of the vessel; but if it has been completely divided, retraction will generally defeat this, and the wound must be enlarged in a direction parallel with the sternum and a costal cartilage should be resected. If the wound is below the third interspace, the hemorrhage may be controlled with a strip of gauze firmly packed against the triangularis sterni muscle. Both ends of the vessel must be secured, because of the free anastomosis with the deep epigastric. If the missile penetrates posteriorly to the angle of a rib, the intercostal artery will almost certainly be cut; and if the wound is enlarged a little, the vessel can be ligated. If the wound is anterior to the angle of a rib, as the artery lies in a groove it will seldom be injured, unless the rib shows marks of violence. If the lower border of the rib shows injury, the artery has probably been cut, and an enlargement of the wound will permit of ligation. After arresting bleeding from the internal mammary or an intercostal artery, close the wound and apply a sterile dressing. Should the signs of bleeding still persist and the physical signs show that the pleura is filling with blood, the source of the hemorrhage must be the lung. Hemorrhage from the lung is sometimes marked by dark, almost black blood, because of the wounding of the branches of the pulmonary artery. If, however, blood has collected in the pleura and been mixed with air because of pneumothorax, it will be much lighter in color; and for the same reason the blood on the dressings is generally of normal hue. Hemoptysis may or may not be present when the lung is wounded; when it is present, the blood is bright in color. Le Conte then describes how we should deal with profuse hemorrhage from the lung. From a mechanical point of view, the thorax is the framework of a pair of bellows, and the lung is an elastic bag within this framework. The only connection between the elastic bag and the outer air is through an air-pipe, called the trachea. When by muscular effort the framework enlarges its capacity, the at-

¹ Phila. Med. Jour., April 14, 1900.

mospheric pressure forces a stream of air into the lung, and the lung distends and fills the space caused by the expansion of the framework. During quiet breathing expiration is accomplished purely by the elasticity of the parts, particularly by the elasticity of the lungs themselves. When the framework is perforated, on expansion of the chest air will enter through the wound, as well as through the trachea; and the more air that enters through the perforation, the less will the lung be able to expand. If the perforation is equal in capacity to the trachea, the lung will collapse entirely, because it is easier for the atmosphere to enter through the perforation than it is for it to enter through the trachea and overcome the resistance of an elastic lung. Le Conte advocates in such cases the insertion of a drainage-tube into the pleural cavity, which preserves free drainage and keeps the pleura filled with air. The muscles of respiration are prevented from acting on the lung; the lung contracts by its own elasticity, as well as by the pressure of the pneumothorax; and the presence of air favors clotting in the severed vessels. [The majority of bullet wounds of the chest heal most satisfactorily, especially if produced by the projectile of a modern small caliber rifle or a revolver bullet. Infection is the exception, not the rule. In a case without ominous symptoms the wound should be sealed, the chest should be immobilized, and the patient should be placed at rest. This is the proper treatment even if the bullet is lodged. If there is severe hemorrhage, the pleura must be opened. The plan advocated by Le Conte is usually efficient; if it is not, the bleeding point must be exposed and the hemorrhage arrested. Delorme, in advocating the conservative management of cases without violent hemorrhage, recommends the injection of artificial serum to remedy "traumatic anemia," but warns us not to give the injection too rapidly and not to give too much, because to do so will engorge the lung, increase the dyspnea, and aggravate the hemorrhage.]

G. W. Armstrong¹ reports the case of a child 18 months old who sucked a **melon seed into the windpipe**. During 9 months the child suffered frequently from attacks of cough, and at the end of this period an examination showed that the left bronchus was obstructed and the lung was partly collapsed. Tracheotomy was performed and a violent expiration caused the extrusion of the foreign body. The tracheal wound was at once closed and the child recovered.

A. C. Coolidge, Jr.,² reports a **method for determining the position of and for removing a foreign body in the air-passages**. It is difficult to manage any mirror or angular instrument that is passed through a tracheal wound. Schroetter has shown that if the head and upper part of the body are bent backward and to one side, a straight speculum may be pushed into the trachea, and its axis will correspond to that of the lower part of the trachea; then if a proper light is used, the entire trachea, and often all of the right bronchus and a considerable portion of the left bronchus, can be seen. The author reports the case of a man aged 23 who had worn a tracheotomy tube for many

¹ Australas. Med. Jour., Sept. 20, 1899.

² N. Y. Med. Jour., Sept. 30, 1899.

years because of stenosis. The last tube broke, and a portion of it was carried into the bronchus. The patient was anesthetized and placed supine, his shoulders projecting over the end of the table, and the head was held downward and twisted toward the right. The wound in the trachea was enlarged somewhat toward the sternum. Coolidge inserted a urethroscope and was able to push it down to within an inch of the tracheal bifurcation. When a mirror was used to reflect light into the tube, the foreign body was discovered in the right bronchus and was removed.

Drasche¹ discusses the **treatment of tubercular pneumothorax by operation**. In 29 cases out of 198 he has used puncture, with or without aspiration, and in one case he has resected a portion of a rib. He says that in a recent case with extremely moderate symptoms the treatment may be expectant; but if it is thought possible that the lung is capable of expanding, the pleura should be punctured with a fine trocar. The cases the author treated by puncture lived longer than those which he treated without intervention, and 4 of his cases were cured. The best results are in cases of hydropneumothorax. In many cases a puncture will quickly relieve cyanosis, dyspnea, and pain; but if it does not do so, the case will probably become worse. It may be necessary to puncture a number of times. It is not necessary that all the air be withdrawn.

Alexander Hugh Ferguson² reports a case of **pulmonary tuberculosis** which apparently recovered after **drainage and the use of iodoform**. This man was 27 years of age and had a swelling under the right clavicle. Fluctuation was very distinct. The man suffered from a cough. He had been losing weight and had night-sweats. The right lung was obviously diseased. No tubercle bacilli were found in the sputum. The patient was anesthetized and the abscess was opened. It was found to be tubercular and to be connected with tubercular disease of the third rib. No bacteria could be found in the tubercular material. After this operation the rapid pulse, the high temperature, etc., still kept up, and Ferguson thought it likely that an abscess had developed in the lung; so about 3 weeks subsequent to the first operation he removed 2 inches of the third rib, cut through the pleura, inserted the index-finger, and found that the apex of the lung felt smooth and soft, resilient and crepitant, and expanded during inspiration. With the full length of the index-finger in the pleural cavity, he felt a large, hard mass opposite the fourth and fifth ribs. It was too hard to be an abscess and too soft for the usual feel of a sarcoma. He closed the wound in the pleura and removed a portion of the fifth rib in front of the mass within the chest. This being done, he divided the pleura here and decided to pack the wound with iodoform gauze, after first suturing the surface of the mass to the parietal pleura, and to wait a few days before doing anything else. Two weeks later a grooved director was pushed into the mass, then a Kocher's director was inserted, and afterward the artery forceps were used according to the method of Hilton—but not a

¹ Wien. med. Bl., Oct. 19, 1899.

² Med. News, Mar. 17, 1900.

drop of pus was found. A piece of the diseased lung was removed and sent to the laboratory, and a dram of iodoform powder was placed in the center of this tubercular mass and iodoform gauze was firmly packed into the lung. Within 12 days this man began to improve. His temperature came down to normal. For 3 or 4 days afterward, and also after the majority of treatments, he expectorated blood and particles of iodoform. Once or twice a week for $5\frac{1}{2}$ months a dram of iodoform, either in the form of a powder or as an emulsion of glycerin, was introduced into the diseased portion of the lung. The dry powder was inserted through a small-sized Kelly cystoscope, the distal end having been made pointed. At the end of 3 months the external wound was closing rapidly, and it was necessary to insert a drainage-tube to permit of the continuance of the treatment. At present the man has reached his normal weight. Occasionally he has a little hacking cough without expectoration. Over the spot in the lung where the dullness was greatest and the consolidation thickest a resonant percussion-note can be detected. Ferguson can find no evidence at present existing of tuberculosis of the lung.

Charles A. Morton¹ reports a case in which he evacuated the pus from a **pulmonary abscess** through the unobliterated pleura without producing infection of the pleura. He passed an exploring syringe needle into the dull area and withdrew pus, and then resected a portion of one of the ribs a little below the angle of the scapula. He then divided the parietal pleura, and on inserting his fingers, could find no pleural adhesions. It was evident that the lung would have to be stitched to the parietal pleura before the pus could be safely evacuated. This was difficult of accomplishment, and it was necessary to grasp the lung with forceps and hold it. When the pleural cavity had been shut off around an area of lung the size of a shilling, a pair of forceps was carried along the needle track into the lung, and $\frac{1}{2}$ of an ounce of pus was liberated. A drainage-tube was carried into the abscess cavity, and around it a mass of gauze was packed. This man recovered. [That Morton most successfully carried out this procedure does not convince us of its propriety. The necessity for prompt drainage is rarely so desperate as to justify the operation. We believe it safer and better, as a rule, to suture the two layers of pleura and wait for adhesions to form before opening the abscess in the lung.]

William Williams² describes an **apparatus for draining an empyema**; it is a valvular drainage-tube. He has recently made a modification in this apparatus in the air-tight joint at the back of the shield. This tube is introduced into the chest and the shield is passed over it, the short rubber tube at the back of the shield having been turned back on itself to allow of this being done. The valve is made by flattening a tube of thin rubber. When an india-rubber valve is in use, it should be immersed in water; otherwise the purulent discharge may glue it up. A bottle containing a 2% solution of carbolic acid in water to a depth of 2 or 3 inches, just to cover the valve, forms a cleanly way of disposing of the discharge, and the bottle can be carried

¹ Brit. Med. Jour., Feb. 17, 1900.

² Brit. Med. Jour., Jan. 13, 1900.

in one of the pockets. The practice of washing out the chest is unnecessary in most cases and is harmful in some. [We have never been persuaded of the necessity, or even of the value, of valvular apparatus for draining the pleural cavity.]

Gerhardt¹ reports a case of **pleurisy with effusion, secondary to typhoid fever**. The effusion was serous, but later became purulent, and from the purulent matter pure cultures of typhoid bacilli were obtained. The diagnosis was rendered positive by exploratory puncture. No operation was required, as the purulent matter was absorbed in about 10 days. If the typhoid bacillus is the sole cause of an empyema, the chance of recovery without operation is good. The reason of this tendency to recovery seems to be that after a time the typhoid bacilli lose the power of producing inflammation. [Westcott gathered together 9 cases of pleural infection following typhoid fever. The cases are reported in Keen's book upon "The Surgery of Typhoid Fever." In one of the cases in which aspiration was performed it was noted on the second aspiration that the bacilli were less virulent than on the first aspiration. Gerhardt's cases confirm the existence of this tendency to attenuation.]

William Jepson writes on **automatic drainage of normal cavities**. He thinks there is no doubt that when a large cavity is to be drained of a quantity of liquid, tubular drainage, either by glass or by rubber tubes, is usually the best form to employ. The advantages of tubular drainage are: First, that the product to be removed is conveyed through the dressings without soiling them, and hence contamination of the wound may be avoided; secondly, that the discharges may be thoroughly withdrawn from the cavity. Tubular drainage must be directed by a competent attendant, who must watch it carefully. Some of the disadvantages of tubular drainage are that the fluid will find exit only through pressure exercised on it from within, through overflow, or by aspiration with a long-nozled syringe. To overcome these objections Jepson has for some years employed automatic drainage. The apparatus consists of a glass chamber, one end of which is attached to a rubber tube to receive the discharges, and the other end to a rubber tube for connection with the cavity to be drained, either through the introduction of a rubber or a glass drainage-tube. The glass chamber is nearly filled with sterile water and is suspended at the side of the bed. The water gravitates into a receiver and creates a vacuum, which aspirates the liquid from the cavity which is to be drained. This method satisfactorily drains the pleural cavity, keeps it free from purulent accumulations, prevents the ingress of air, and thus, by permitting the approximation of the two layers of the pleura, facilitates repair. [Drainage by siphonage is employed after suprapubic cystotomy. The apparatus of Cathcart as modified by Keen is very useful.]

A. Pearce Gould² discusses at length the **surgical aspects of**

¹ Mittheil. aus den Grenzgebieten der Med. u. Chir., vol. v, part 1, 1899.

² Practitioner, Feb., 1900.

pneumonia. Pneumonia not unusually results in conditions which require surgical measures and operations. There are three sequelæ of pneumonia which require surgical treatment—empyema, pulmonary abscess, and gangrene of the lung. It is not so fully appreciated as it should be how often empyema follows pneumonia. The most common cause of a secondary rise of temperature or of a failure of the signs of pneumonia to clear up is the occurrence of empyema. The pleura may be infected by the pneumococcus, the streptococcus pyogenes, or the tubercle bacillus. An adjacent abscess also may burst into the pleural cavity. The form of empyema which runs the most favorable course is that which is secondary to pneumonia and arises from infection of the pleura with pneumococci. One reason why the prognosis of empyema in children is so much more favorable than in adults is that in children nearly all cases arise from infection of the pleura with pneumococci. The surgical diagnosis of empyema is made by the use of an exploring syringe; not the common hypodermic syringe. The needle of the ordinary syringe is so slender that it may be easily broken, so fine that it may not carry the purulent fluid, and so short that it may not reach the pus. It is best to use an aspirator with the needle, because if pus is found, a considerable amount can be drawn off at once, thus relieving the patient and placing him in a more favorable state for subsequent operation. The exploration should be made with great antiseptic care; a local anesthetic should be used, and a spot should be chosen where the dullness is well marked. The skin is drawn up by an assistant, so that the puncture will be oblique when the parts are allowed to slip back. When the skin is frozen, a narrow knife is introduced on the upper edge of the rib, and then the exploring trocar or needle is thrust sharply through this puncture. Pus is permitted to flow out slowly, and if it becomes mixed with blood, or if the patient begins to cough, the cannula is withdrawn. The flow of pus may be suddenly arrested by the plugging-up of the needle; and when this happens, a plunger is passed down the cannula to free it. A dry tap may be due to a faulty procedure; for instance, if a tubular needle is forced through the uncut skin, a little plug of skin may enter the needle and plug it; or the cannula may push before it the parietal pleura or a layer of false membrane; or it may be pushed directly into the lung or into the liver or too high above the level of the pus. If the collection of pus is very small, it may require several punctures to find it. When the cannula is withdrawn, the skin is allowed to slip down, and the puncture is dressed with a collodion dressing or a little gauze. Every case of pneumococcic empyema should be operated upon as soon as diagnosticated, and this treatment should be carried out, even if the empyema has emptied itself through a bronchus. In some cases the surgeon must operate at once when called to the patient; but whenever practicable he should relieve the pressure upon the lung, heart, and vessels by partly emptying the pleura through aspiration a few hours before the major operation. A general anesthetic is usually given, but it must be given with the greatest care. Chloroform is better than ether, but as soon as the pleural cavity is opened the

administration of an anesthetic should be suspended, because the future steps of the operation are almost painless. The very best anesthetic for this operation, when given by an expert, is a mixture of nitrous oxid and oxygen. The patient is placed on his back, as it is not safe to place him on his sound side. When it is necessary to open the chest quite at the back, the patient must be turned over on the diseased side and the surgeon should stand behind him to operate. In a large empyema, that form called general empyema, the opening should be made just in front of the angle of the scapula at the level of the ninth rib. A piece of rib is resected without opening the pleura, and the pleura is opened above the intercostal vessels. A finger is introduced to explore the size, shape, and depth of the cavity, and to discover and remove masses of coagulated lymph. It is not wise to wash out the pleura, but it may be wiped by swabs of sterile gauze. A large rubber drain the size of a forefinger is inserted, and its end must not project more than an inch within the pleura. Gould places a suture at each end of the wound. Occasionally the rapid escape of pus is followed by hemorrhage from the pleura. This may be very serious. When it happens, the dressing should be applied quickly and the patient gotten to bed rapidly and made to lie upon the diseased side. Of course this statement does not apply to external bleeding. When exploring the cavity with the finger, adhesions should not be broken down. These adhesions may be vascular and bleed profusely, and to a certain extent they aid in repair. In some cases the lung will at once expand almost up to the parietes, in spite of the presence of the wide opening in the pleura. This is due to the free circulation of the blood through the compressed lung opening it out again, and also to the pressure of air during expiration. The extent to which expansion occurs at the time of operation is the best index of the rapidity with which complete healing will take place. Immediately after the operation the patient is placed flat or almost flat in bed and shock is actively treated. The next day, or as soon as the improved heart action justifies, the patient should be propped up in bed; and when recumbent, encouraged to lie on the affected side. The upright position facilitates drainage, leads to fuller respiratory movements, and brings about more forcible cardiac contractions. The patient is encouraged to take deep breaths, to sit up out of bed, and to move about a little as soon as the temperature and pulse justify. When the wound is healed, further expansion of the lungs is promoted by proper exercise, and, in young people particularly, every care must be taken to give to them a large vital capacity. The tube should not be taken out for at least 3 days after operation, but after that it may be taken out and cleaned every day or so. When the discharge is reduced to a small quantity of serum only, some surgeons reduce the size of the tube, but there is no advantage in this. The tube, as a rule, should be left in place until the pleural cavity has closed up around it. This can be determined to have taken place when the discharge is reduced to 1 or 2 drams of serum in the 24 hours, and also by introducing a bent probe and determining the size of the cavity. When this condition obtains,

the tube is withdrawn—not gradually shortened. Each day subsequently, for 3 or 4 days, a director can be passed along the closing sinus for the full length of the tube; and if there is any accumulation of fluid, it will be shown at once and the tube can be inserted again for a time. It is impossible to mention a time limit at which the tube should be removed. An empyema may be healed up in 3, or even in 2, weeks; but 4 or 6 weeks are often necessary, and bad cases may require months. Gould then considers the surgical treatment of pulmonary abscess and gangrene, and discusses pneumonia as a sequel to surgical operations, injuries, and diseases. Lobar pneumonia occasionally occurs immediately after an operation. It has been suggested that it may be caused by the use of an infected inhaler, but there is no real proof of this statement. Another supposed cause is the exposure of the patient's chest; such exposure may lead to bronchitis or bronchopneumonia, and should be guarded against. It may happen that an operation is performed just as an attack of pneumonia is beginning. Bronchopneumonia is a much more frequent sequel of operations; it is apt to follow aspiration of blood into the finer bronchi during operations about the mouth, tongue, etc.—indeed, it is the chief cause of death after such operations. The usual plan of preventing this to-day is to perform a preliminary laryngotomy or tracheotomy, and then to plug the pharynx or trachea. The position of the head is a great means of preventing the accident. The head may be turned over to one side or thrown back over the end of the operating table. Bronchopneumonia is often the cause of death in malignant disease of the jaw, tongue, palate, tonsil, pharynx, larynx, or esophagus, and in ulcerating or sloughing conditions about the mouth, nose, and pharynx. Middle-aged and elderly subjects suffering from malignant disease will usually die if such complication develops; in young and robust patients bronchopneumonia may be recovered from, but even in these the mortality is high. Traumatic pneumonia caused by injuries of the lung is characterized by its limited area and by the absence of any tendency to spread, unless infecting organisms are carried into the damaged lung.

F. W. Parham read to the Southern Surgical and Gynecological Association an abstract of an elaborate article, since published as a monograph (New Orleans, 1899), on **thoracic resection for tumors growing from the bony wall of the chest**. It is a study of great importance and value. He presents the record and discusses the reports of all cases of resection for malignant tumor of the thoracic skeleton found in medical literature. He divides tumors of the ribs and sternum into primary (including fibroma, chondroma, sarcoma, and their combinations) and secondary (including sarcoma and carcinoma). The great danger of these operations is acute thoracic pneumothorax, and its onset can be prevented by the employment of the Fell-O'Dwyer apparatus. For a case of tumor of the thoracic wall the first question is, Should the tumor be removed, or should it be let alone? The answer is not difficult in cancer, because these tumors are secondary and do not offer the same justification for a

formidable operation. If the tumor is demonstrably primary and has apparently not invaded any structure which is irremovable, then an operation should be done if the condition of the patient justifies it. In this group belong a few carcinomas secondary to mammary cancer, fibromas, chondromas, sarcomas, and, exceptionally, gummas of the ribs and sternum. The surgeon must determine how far he will carry an operation—shall he stop at the pleura? shall he enter that cavity and stop at the diaphragm? or shall he stop at nothing short of the heart or the whole of one lung? He then considers hemorrhage, shock, and pneumothorax. The following suggestions are offered for the prevention of pneumothorax: early operation, before the tumor is of great size; the establishment of preliminary adhesions; the substitution of a temporary hydrothorax for pneumothorax; the injection of sterilized air; the intubation method; intrabronchial tension with the aid of compressed air to neutralize the mediastinal vacuum; Doyen's method; the Fell-O'Dwyer apparatus; stitching the lung to the margin of the thoracic wound; obturation of the wound of the pleura; separation of the parietal pleura by dissection and suturing it to the visceral pleura, etc. He considers the value of each of these plans, and then sets forth at length the treatment of shock and hemorrhage. [Keen performed this operation recently in the Jefferson College Hospital. The patient was a negro woman. The tumor was a spindle-celled sarcoma. The operation was completed easily and satisfactorily and without any threatening symptoms.]

DISEASES OF THE VASCULAR SYSTEM.

John O'Connor¹ writes on the surgical treatment of varicose veins. He was much disappointed with the operation of removal of a number of pieces, and came to the conclusion that complete excision was necessary. It is evident that multiple incisions and ligations must often be useless, owing to the labyrinthine distribution of the varicose veins and their tributaries. At times it will be found difficult to avoid buttonholing the skin when the veins are adherent to it. He has been led to adopt the following operation: An incision 2 inches in length is made over the saphenous opening and the internal saphenous vein is ligated in two places and divided. If there is no varicosity above the knee, the wound is at once closed and dressed. If the femoral portion is affected, the vein, after ligation at the saphenous opening, is dissected free, and its branches are grasped with pressure forceps and ligated. Usually, if there are varices above the knee, there are also some below; and when this is the case, the incision is carried downward, directly over the vessel, until the lowest limit of the disease is reached. In his last case O'Connor made an incision 27 inches long, and through this removed 43 inches of diseased internal saphenous vein and branches. If the varices do not extend above the knee, after tying the saphenous trunk, as described, an incision is made over the affected portion, a

¹ Lancet, Oct. 14, 1899.

ligature is applied above and below, and the whole intervening mass is removed by dissection, all branches being caught with forceps. When the main vein is removed, the branches are ligated with fine catgut. Often the external saphenous vein is likewise affected, and it is dealt with in a similar manner. [Operations for varicose veins often relieve but do not absolutely cure. Cases must be selected, and no single method is universally applicable. In every case we should determine whether the deep veins are blocked. If they are, an operation will do harm by obliterating the collateral circulation, and permanent edema will result. It is also necessary to determine if the blood is flowing in the wrong direction in the internal saphenous vein before deciding on the form of operation applicable to a case. See Delbet, YEAR-BOOK for 1899.]

Biagi and Buchi,¹ writing on the **treatment of varicose veins**, state that none of the usual methods are entirely satisfactory. They are now employing the method of Durante. This consists in the subcutaneous passage of fine catgut into the interior of the veins. From 8 cm. to 10 cm. of catgut should be soaked for about 24 hours in Piazza's fluid. The catgut is then dried, and a small special trocar and a cannula are introduced into the vein. The trocar is withdrawn, and through the cannula the catgut is passed into the vein. The clot forms very quickly. [Piazza's fluid consists of 1 gram each of sodium chlorid and ferric chlorid and 4 grams of distilled water. The solution used should be of a strength of 30%.]

J. B. Nichols² describes the uses of **gelatin as a hemostatic agent**. He says that it can not be injected into the veins with safety, but it can be given subcutaneously in the treatment of aneurysm or internal hemorrhage. The subcutaneous use of gelatin has been recommended for hemoptysis, intestinal hemorrhage, hematuria, etc. The subcutaneous use has distinct dangers. It has even produced death, and it should be resorted to only from necessity, and every precaution should be taken. Nichols discusses particularly the local use of gelatin. He uses a solution containing from 5% to 10% of gelatin and from 0.6% to 1% of chlorid of calcium or chlorid of sodium in 100 parts of water. He sterilizes this by heating it to 100° C. for 15 minutes, repeating the process once a day 2 or 3 times. This preparation is very useful in epistaxis, and it has been found valuable when given by the mouth in hemorrhage from gastric ulcer, but it seems to be of no avail when used locally in hemorrhage from the bladder. It has been successful in bleeding from hemorrhoids and in uterine hemorrhage. In uterine hemorrhage it can be injected into the uterus, or vaginal tampons containing gelatin may be used. The author has successfully used gelatin in a wound in a hemophiliac. He took a bacteriologic culture-tube containing 10% sterile gelatin, melted the gelatin, poured it into the wound, and sutured the incision. The hemorrhage was arrested. [Our experience has convinced us that gelatin is a valuable hemostatic agent. It is not, however, completely innocuous when injected. Its use may be followed by albuminuria, hemoglobinuria, or embolism.]

¹ Supplemento al Policlinico, An. V, No. 42.

² Med. News, N. Y., Dec. 2, 1899.

E. A. Peters¹ points out some of the uses of **suprarenal extract in association with cocain to obtain a bloodless and painless operation.** He says that the hemostatic properties of suprarenal extract are obtained by soaking a pad in a 50 % solution of the material. It is extremely useful in operations on the nose, throat, and ear. When cocain is combined with suprarenal extract, we use about twice as much of the extract as we do of the cocain, for it is about one-half as toxic. The 10 % solution of suprarenal extract and cocain is useful in the nose and pharynx. Such solutions can be prepared from tabloids. About 2 hours after the operation bleeding may set in, which can then be arrested by plugging. [The hemostatic property of suprarenal extract was pointed out by Schäfer in 1898. Aldrich uses the following solution: 1 part of suprarenal extract, 1 part of boric acid, and 48 parts of water. This solution should be filtered and should be freshly made when required. The hemostatic effect is said to last from 20 minutes to 1 hour. It can be combined with cocain, and the addition of the last-named drug is said to prevent after-bleeding.]

Lancereaux² has obtained remarkable results in the **treatment of aneurysm by the subcutaneous injection of gelatin.** Two hundred and fifty cubic centimeters of a solution of 2 gm. of gelatin in 100 gm. of salt solution are injected under the skin of the thigh, and the injection is renewed at intervals of from 2 to 15 days. From 15 to 20 injections may be given. The subcutaneous injection of gelatin increases the coagulability of the blood. Stoïcesco has reported 6 cases of aortic aneurysm and innominate aneurysm treated by this method with striking benefit. Lancereaux and Paulaseo³ point out that the subcutaneous use of gelatin is much more serviceable in sacculated than in fusiform aneurysm, that the material increases the coagulability of the blood, and that the coagulation in the aneurysmal sac results from slowing of the circulation within the sac and roughening of the interior of the sac. Geraldini⁴ reports 4 cases of aneurysm of the aorta which were treated by the subcutaneous use of gelatin solution of a strength of 2 %. The injections caused very little pain, transitory burning being all that was complained of, and they produced no local ill effects. In the first case, which was one of innominate aneurysm, 45 injections were used and the patient was greatly benefited. The tumor diminished in size and ceased to pulsate. Neuralgia and dysphagia disappeared. The second case, which was an aortic aneurysm, received 60 injections and was very much improved. After the twenty-ninth injection it was found that albuminuria had appeared, so the injections were suspended for a few days. The third case, also an aortic aneurysm, received 40 injections and was much benefited; and the fourth case, which was an abdominal aneurysm, was also much relieved. [We recently tried this in a case of abdominal aortic aneurysm, but without success.]

F. Kammerer⁵ reports a case of **ligation of the first portion of**

¹ Brit. Med. Jour., July 8, 1899.

² Lancet, Oct. 22, 1898.

³ Centralbl. f. innere Med., July 22, 1899.

⁴ Gaz. degli Osped., Feb. 4, 1900.

⁵ Med. Rec., Dec. 25, 1899.

the left subclavian artery for aneurysm. The patient died after 4 weeks.

W. W. Keen¹ reports a **nephrectomy for a large aneurysm** of the right renal artery, and gives a résumé of the 12 formerly reported cases of renal aneurysm. This patient was a woman 45 years of age supposed to be suffering from hydronephrosis. An abdominal incision disclosed a soft and almost fluctuating tumor. When a puncture was made, nothing but blood escaped. The descending colon lay to the left of its center and was adherent to it by the mesocolon. When the outer layer of the mesocolon was torn through, the tumor was isolated and delivered. The pedicle was very broad and had to be secured in 7 different sections. This patient recovered, and a careful examination of the tumor showed that it was a false aneurysm of a branch of the renal artery and that there was pressure atrophy of the kidney.

A. E. Halstead² reports a case of **ligation** of the first portion of the **right subclavian, for aneurysm** of the third portion. This patient recovered completely. There were points of great interest about this case. The aneurysm involved the entire third portion of the subclavian and a small part of the second portion. The subclavian vein was found above the artery, and because of this anomalous position it was torn in endeavoring to retract the artery downward. The right subclavian had an anomalous origin, as it came directly from the arch of the aorta. During this operation it was found necessary to resect the clavicle. Halstead now considers resection of the clavicle a necessary step in this procedure, and recommends a preliminary resection of the clavicle and of a portion of the sternum in all cases. This is the second case on record in which the patient survived such an operation. The report was made 7 weeks after the operation.

Manteuffel³ reports a case of carcinoma of the right kidney in which, **while removing the kidney**, it was found necessary to also remove a **portion of the vena cava** which the growth had involved. He made an opening 9 cm. long and 2½ cm. wide, and closed it by means of sutures. The patient was out of bed in 18 days.

The Philadelphia Medical Journal⁴ discusses operative **end-to-end anastomosis of the large blood-vessels**. This operation has rarely been employed. It has, however, decidedly practical value, and will probably be practised much more frequently in the future. At the recent Congress of German Naturalists and Physicians at Munich, Kümmell reported 2 cases in which he anastomosed the femoral vessels by circular suture. In the first case, while removing cancerous lymphatic glands, he discovered that the femoral artery was involved. He cleared the artery until healthy portions were reached, clamped the vessel with 2 artery forceps, and resected a piece 4 cm. long. He flexed the leg, invaginated the upper extremity of the artery into the lower extremity, and sutured it with a continuous silk suture, being careful not to perforate the intima. He removed the artery forceps and found

¹ Phila. Med. Jour., May 5, 1900.

² Centralbl. f. Chir., July 8, 1899.

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³ Med. News, April 14, 1900.

⁴ March 17, 1900.

some bleeding from the stitch-holes, which he arrested by passing a second row of sutures through the adventitia. The circulation was at once reestablished in the leg, and the man recovered from the operation. It was impossible to determine from this case what the ultimate results would have been, for the growth soon recurred and involved the artery at the point of anastomosis. In the second case the same surgeon sutured the femoral vein in a like manner, having been obliged to excise 2 cm. of a vein infiltrated with cancer. He did not invaginate the end in this case, but sutured with continuous silk sutures which passed through the intima. The thinness of the vessel-wall rendered this necessary. When the artery forceps were removed, the livid discoloration of the leg at once disappeared. There was some bleeding from stitch-holes, which was arrested by superficial sutures. This patient recovered, and left the hospital in 24 days. Kümmell was under the impression that circular suture of the blood-vessels had never been carried out before, but this is not the case. Murphy, of Chicago, successfully sutured the femoral artery some years ago. Garré has sutured the brachial artery and the common carotid artery with recovery. Many experiments on animals indicate that the procedure is practicable. Briau has successfully performed circular suture of the artery of an ass. Thrombosis or embolism has not followed in any case so far reported. If invagination is practised, it should be made in the direction of the blood current. Some surgeons have suggested suturing the adjacent fascia over the vessels to give support. Thrombosis and embolism are early dangers; the formation of an aneurysm is a later danger. This procedure will not be frequently required. It will be most commonly needed during the extirpation of tumors. The operations so far reported do not show that there is any special danger of thrombosis or embolism, and we are therefore inclined to think that this procedure is better than ligating the larger vessels, because ligation is always attended with serious danger of gangrene.

B. M. Ricketts,¹ in a study of the **femoral artery and vein, and their destruction without loss of the leg**, reaches the following conclusions: When the lumen of the femoral artery or of the femoral vein, or of both, is occluded either suddenly or gradually, it is not invariably necessary to amputate. It is better to ligate either vessel or both vessels, as the case may require, and to give the patient the benefit of the doubt. If there is some chronic pathologic condition of the thigh, the ligation of either vessel or of both vessels is less likely to be followed by gangrene than when ligatures are used after injury of a normal thigh. It may be possible to establish an end-to-end anastomosis of the vessels; but even when this is done, the lumen of the vessel will become occluded sooner or later. The suturing of a wound in a vein or artery has no advantage over immediate occlusion by ligation. It seems likely that gangrene may be due to septic infection associated with the occlusion of the femoral vessels.

Howard Lilienthal² reported a case of **purulent pericarditis**

¹ Jour. Am. Med. Assoc., Aug. 12, 1899.

² Med. News, Nov. 25, 1899.

cured by operation. The patient was a boy 15 years of age who had an attack of pneumonia, followed by pericarditis. Eighteen and one-half ounces of pus were withdrawn from the pericardium by aspiration. The next day there was decided cyanosis, and it was evidently unsafe to give ether or chloroform, so the operation was performed under local anesthesia by cocain. About $\frac{3}{4}$ of an inch of the fifth intercostal cartilage was taken away, up to a point about $\frac{1}{4}$ of an inch from the edge of the sternum. An aspirating needle was inserted and used as a guide. The tissues of the mediastinum were divided and the pericardium was incised. Forty ounces of pus flowed out. The wound was left partly open to permit of free drainage and was irrigated daily with decinormal salt solution. The boy was out of bed 3 weeks after the operation, and 4 weeks after the operation was discharged cured. Cyril Ogle and Herbert Allingham¹ report a case of purulent pericarditis upon which they operated. The patient died 14 hours after operation. The authors have decided that a method of approaching the heart better than that formerly used, is as follows: Open the pericardium from below, through the diaphragm. If this is done, the fingers, or sponges on holders introduced into the sac, will be able to sweep around the entire heart, back and front; and to remove adherent masses of lymph. So far, they have had no opportunity of employing this operation upon the living subject, but they find it very easy of accomplishment on the dead body. An incision about 3 inches in length is made along the lower edge of the seventh left costal cartilage, the upper end of the incision being at the costoxiphoid angle. The cartilage is exposed and is pulled somewhat outward and upward, when the fibers of the diaphragm become visible, and also the cellular interval between the attachments of the diaphragm to the cartilage and to the xiphoid appendix. This cellular interval is enlarged by cutting or tearing through the muscle of the diaphragm, and a mass of fat is reached just above the diaphragm in the space between the pericardium behind, the sternum in front, and the diaphragm below. This fat, with the diaphragm, is pulled downward, when the pericardium presents, and can be incised or opened with forceps at its lower part in front. It is pushed aside, just as is done in suprapubic cystotomy. The superior epigastric artery is kept well toward the middle line. The pleural cavity can not be injured. Drainage is obtained from the most dependent portion of the sac, and when the patient is partly propped up there is a large opening, and it is easy to explore, and cleanse the heart thoroughly. [Puncture for purulent pericarditis is not reliable and is essentially unsafe. It is much safer to incise, and an incision like the one just described gives free access and permits of satisfactory drainage. Roberts in 1897 collected 35 cases of purulent pericarditis operated upon, and Ljunggren added 6 to this list, making 31 in all. Sixteen recovered. In many cases the operation should be performed with the aid of a local anesthetic, and, as Roberts and Ljunggren maintain, an operation ought to be performed as soon as the diagnosis is made. Ljunggren's article is in *Nord. med. Ark.*, N. S., 1899, vol. ix,

¹ *Lancet*, Mar. 10, 1900.

No. 28. An abstract of it will be found in the *Ann. of Surg.*, Nov., 1899.]

Loison,¹ in a study of **wounds of the heart and pericardium**, reviews the literature of the subject, and discusses the reported cases. He concludes that the symptoms which indicate the existence of a wound of the heart and pericardium are as certain as those which indicate wounds of the peritoneum and abdominal viscera; but in each case the diagnosis is extremely difficult. The prognosis is not always hopeless, and there have been numerous successful operations by different surgeons.

Wehr² has made a series of experiments upon animals in order to determine the best method of reaching and **suturing a wound of the heart**. He says that a surgeon must have ample room; hence the wound made to reach the heart must be a large one. If he attempts to reach it through a small opening, the sutures will be passed slowly and with great difficulty. The wound should be one which not only exposes the heart satisfactorily, but which is capable of being enlarged in any required direction. No attempt should be made to make the operation bloodless by compressing the heart, as this may cause death. The author recommends the following method: Begin the incision on the right edge of the sternum at the upper level of the fourth rib, and carry it straight across the sternum to above the cartilage of the fourth rib on the left side. The incision is then carried in a curved direction over the fourth, fifth, and sixth costal cartilages, and is taken inward in a transverse direction through the seventh costal cartilage and the base of the xiphoid. The costal cartilages are resected so that the cut surfaces are inclined, the plane which cuts the cartilage being nearer to the sternum internally than externally. After resection of the cartilages and sawing of the sternum, care having been taken to avoid injuring the periosteum of the mediastinum, this flap of skin, muscle, and bone is lifted gradually, while the pleura is dissected from it. When this has been accomplished, the flap is forced back, thus fracturing the costal cartilages on the right side.

Charles A. Elsberg³ has made an elaborate experimental investigation of the treatment of wounds of the heart by means of **suture of the heart muscle**. He reviews the history of this subject comprehensively and sets forth the opinions of the various surgeons who have written and spoken upon it, and who have reported cases. He then describes at length his experiments upon animals. His conclusions are as follows: It is, of course, incorrect to draw conclusions as to the chances of success in man from the results obtained in these animal experiments, for animals are placed under very unfavorable conditions after such an operation. They are restless and can not be kept quiet, and perfect cleanliness is impossible. From the animal mortality in these experiments, no just conclusions can be drawn as to what would probably be the human mortality. The experiments seem to show certainly, how-

¹ *Rev. de chir.*, 1899, Nos. 1, 2, 6, and 7.

² *Centralbl. f. Chir.*, July 8, 1899.

³ *Jour. of Exp. Med.*, Sept.-Nov., 1899.

ever, that the heart is able to bear a much greater amount of manipulation than has been suspected. Even very extensive wounds of the heart may heal. The healing process is exactly analogous to repair in any other muscular tissue. Of course, in a large wound, numbers of muscle-fibers are destroyed and are replaced by connective tissue, but this does not interfere with the function of the cardiac muscle as a whole. Some of the results of the experiments described can be applied to the human heart. We find that the knowledge which we possess of wounds of the heart in man agrees with that obtained from animal experiments. Wounds of the heart in man, when all other means have been tried and have failed, can and ought to be sutured. In the past it was greatly feared that the application of sutures would cause the sudden arrest of the heart's movements during the manipulations, but this is found to be untrue. No more sutures should be used than are necessary; the fewer employed, the smaller the amount of connective tissue which will be formed, for all muscle-fibers that are compressed by sutures atrophy and are eventually replaced by connective tissue. It is probable that this connective tissue will not lead to degenerative changes in the heart muscle. The suture should always be an interrupted one. There are dangers and disadvantages in the continuous suture which render it unfit for employment in this region. The sutures should include as little of the heart substance as possible. They should penetrate the epicardium and a small portion of the thickness of the heart muscle. When the heart's action is not too rapid, each suture should be tied during diastolic relaxation. Cappelen tied the sutures during systole; Rehn in his case tied them during diastole; but the experiments upon animals indicate that it is safer to tie them during diastole. The difficulties of applying the sutures to an organ in such constant motion are not so great as might be anticipated, for the heart can be grasped with forceps, and the needle and suture are then easily passed. The cases will always be few in which this extreme method of treatment is required. Some patients recover from even large wounds of the heart without any local treatment. Each case must be considered by itself. Of the 9 cases of suture of the human heart on record, 4 recovered completely and 4 died of complications referable to other organs. The sutures should, of course, be of silk.

Martin W. Ware,¹ in an editorial article, reviews the subject of **surgery of the heart**. Ninni's patient was a man of 33 who had been stabbed in the chest. He was injured only a few hundred feet from the hospital. He was at once carried into the ward, and it was found that there was a wound in the fifth left interspace in the mammary line. He was very much collapsed; the pallor was nearly cadaverous; there was no radial pulse; the heart beat tumultuously. An incision was made in the fifth interspace near the margin of the sixth rib, as far as the mammary line. Along the sternal margin a vertical incision was carried to the third rib, and another horizontal incision was made in the third interspace. This quadrilateral flap was turned to the left. The

¹ Ann. of Surg., Oct., 1899.

pleura contained a large amount of blood, and it was therefore incised and the clots were turned out. The distended pericardium was discovered, and there was a wound in it 3 cm. long. This wound was enlarged, and clots and a stream of blood escaped. No anesthetic was used in this operation. The hemorrhage from the heart was controlled temporarily by the introduction of the index-finger. The wound in the heart was 25 mm. in length, and was situated in the anterior wall of the left ventricle. Two sutures of silk completely arrested the bleeding. The patient died before the cutaneous flap was adjusted. Ninni then reviews the 8 cases of heart wound upon record. He says that death is instantaneous in 8% of the cases of penetrating wound of the heart. As causes of death at remoter intervals he names compression of the heart from escaped blood, complications of adjoining viscera, loss of blood from secondary hemorrhage, and infection. Ninni then reviews the various methods of exposing the heart and suggests the following method of his own: Make an incision along the sternum from the third to the sixth rib, and another incision of the same length in the mammary line. Join these by a horizontal incision in the fifth interspace. Cut the intervening ribs and turn up the flap composed of bone and muscle. A few of the cases were operated upon without the employment of an anesthetic, and in almost all of them an infusion of salt solution was given. Ware reviews the paper of Rydygier, of Giordano, of Podrez, of Loison, and of Terrier and Raymond. This editorial article contains an admirable résumé of the views of some of the foremost authorities upon cardiac surgery.

DISEASES OF THE LYMPHATIC SYSTEM AND OF THE THYROID GLAND.

Jessen ¹ maintains that **enlarged glands of the neck** are frequently connected with diseases of the **tonsil and pharynx**, and not unusually when the tonsil or pharynx is treated the enlargements in the neck will disappear. He reports cases in which the swellings disappeared after the removal of adenoid growths. He believes that in tubercular glands of the neck in children the microbes which cause the disease enter by way of the pharynx or tonsil, and occasionally by carious teeth; and whenever lymphatic glands enlarge in the neck, a careful search should be made for any such intra-aural, nasal, or pharyngeal disease, and if it is found, it should be promptly treated. [Clinically, it has been positively ascertained that tubercular glands of the neck are frequently preceded by disease of the tonsil or pharynx. Some assume that in the area of pharyngeal or tonsillar disease tubercle bacilli are admitted into the lymph-vessels and are carried to the glands, where they multiply and cause tubercular lymphadenitis. Others maintain that intra-aural disease is often responsible for ordinary inflammation of the cervical glands, that inflamed glands constitute points of least resistance, and that in such points tubercle bacilli lodge and multiply.]

¹ Centralbl. f. innere Med., Sept. 2, 1899.

Lennander ¹ describes a **method of removing the deeper pelvic glands** in the inguinal region with the iliac and obturator vessels. The author believes that when malignant disease occupies this region no operation is of use unless it is as radical as is above indicated. It is employed when the primary malignant growth can be removed and when there is no inoperable secondary involvement. The same procedure may be carried out for grave tubercular lymphadenitis, although in the latter condition it is only necessary to remove the lymph-glands and the surrounding tissue, the undiseased tissue and fat being permitted to remain. This is advisable, because the fat will after a time develop new lymphatics and a collateral lymphatic circulation will be obtained. The same method is pursued for suppurative conditions. In order to perform this operation an incision is made from the pubic symphysis to the anterior superior spine, along the course of Poupart's ligament. It is then taken along the crest of the ilium for about half the length of that bone. An incision is carried from the first cut over the femoral vessels, so as to give access to the lymphatics of that region. The retroperitoneal tissues are reached through this cut, and the glands which lie in the iliac fossa, as well as the vessels which pass into the true pelvis, are removed. It is necessary to divide the inner attachment of Poupart's ligament to the pubis. On lifting the peritoneum from the iliac fossa, the vas deferens and the spermatic cord are lifted with it, and the iliac vessels are freely exposed.

W. Watson Cheyne ² advocates a **radical operation for tubercular glands of the neck**. He does not think it is proved that glandular tuberculosis arises from disease of the teeth, tonsils, etc., but believes it more likely that the disease in the pharynx, tonsil, etc., is responsible for a genuine acute inflammation of the glands of the neck. In these inflamed glands vital resistance is lessened, and tubercle bacilli are deposited from the blood and become active. If tubercular glands remain smooth and hard, it is rarely necessary to operate; but if the glands enlarge progressively, an operation should be performed. Some surgeons advocate curetting if softening occurs, but Cheyne opposes this procedure, because the small glands which are unsoftened are not removed; and, in the second place, when scraping is practised some tubercular material remains and may infect the wound and be responsible for recurrence. If a gland has completely broken down, however, it then may be curetted away, and the wound injected with a solution of iodoform and sutured. A tubercular ulcer and a tubercular sinus should be excised and the wound touched with pure carbolic acid. In removing glands Cheyne advocates a very radical method. He removes the diseased glands and the fat in a single mass, maintaining that in the fat are numerous minute glands which are diseased, and which, if they remain, will reproduce the trouble. In this operation the jugular vein is exposed at the root of the neck. There is some danger of wounding the vein, but this can be prevented if the deep fascia is incised below the enlarged glands, the vein being thus exposed and the sheath then

¹ Centralbl. f. Chir., No. 37, 1899.

² Brit. Med. Jour., Dec. 16, 1899.

being opened. The tubercular mass being removed from below upward, branches of the vein which are in the way are tied and divided. In cases in which sinuses exist and cases in which there is suppuration, the vein is caught between two ligatures and removed along with the glands. Whenever the vein is thus removed, the spinal accessory nerve must be identified and saved from injury. In some cases, in order to expose this region satisfactorily, it will be necessary to cut the sternomastoid muscle transversely.

Francis J. Shepherd¹ makes some remarks on the **symptoms and operative treatment of bronchocele**, especially in relation to Graves' disease. He tells us that simple goiter generally begins as a small kernel in one of the lobes of the thyroid, and increases gradually in size. Occasionally both lobes are affected, and likewise the isthmus; but the goiter is generally unilateral. The unilateral goiter is usually encysted, and the cysts may be single or multiple, and may contain clear or bloody fluid or a semisolid colloid material. A cyst may suddenly become larger from hemorrhage. In the interstitial or parenchymatous form of goiter the gland uniformly enlarges. This form of the disease is most common in young girls at the period of puberty, and usually disappears in a few months. It increases in size before menstrual periods, and often when it is not of the soft, vascular variety it is improved by the use of thyroid extract and the iodids. In all these forms of goiter the general health is apt to be affected. The patients are nervous, breathless on exertion because of tracheal pressure, and sometimes there is tachycardia; in fact, in some of the encysted solid goiters the patients exhibit the evidences of a sort of pseudo-Graves' disease. Removal of the growth gives marked relief. The author then points out the symptoms of Graves' disease and shows that they are the exact opposite of those of myxedema, the former being due to too much thyroid and the latter to too little. In cases of pseudo-Graves' disease in which the group of symptoms is due to increase of thyroid tissue, operation gives great relief. In true Graves' disease the relief afforded by operation is not so great. The operation performed in true Graves' disease is the removal of one-half of the enlarged thyroid, and is not without danger. A large element of danger is in the use of a general anesthetic. Because of this, Kocher employs local anesthesia by cocain; but even with local anesthesia the operation is dangerous, and Kocher in his last 15 cases lost 2. Operation should be advised in all rapidly developing growths, especially if they are solid. The operation is urgently necessary if there be dyspnea. The operative procedure selected depends upon the kind of case. In simple cysts, when the cysts are large and there are no more than 2 or 3 of them, enucleation should be performed. In this operation an incision is made over the cyst down to the gland, the anterior jugular vein being tied if seen. The gland is excised down to the bluish-white capsule of the cyst. The cyst is opened and its contents evacuated, and then the cyst-wall is pulled out of the small incision in the gland and any vessels which bleed are

¹ Montreal Med. Jour., Dec., 1899.

grasped as they are torn in separating the cyst. In an adherent cyst the separation may be very difficult, but in a fluid cyst it is easy and the vascularity is not so great. In the solid, colloid, encysted growths enucleation is more difficult, because of considerable vascularity. Here great care must be taken to get into the proper capsule, preferably the deeper one. Even in these cases, before enucleating the tumor should be opened and some of its contents removed, as this will lessen the difficulty of extraction. In diffuse cases or interstitial cases in malignant disease, when there are numerous small veins, when the growth is very large, and when there is the true vascular thyroid of Graves' disease, excision should be performed. In Graves' disease and the interstitial cases only one lobe should be excised. The author then discusses the after-treatment of those cases that have been operated upon.

Bouffleur¹ maintains the following views as to the **proper treatment of goiter**: The nature of the enlargement should be accurately determined. Struma is treated by the iodids and thyroid extract and by parenchymatous injection of iodoform or carbolic acid; and if these simple means fail, enucleation or partial thyroidectomy should be performed. A small adenoma is enucleated; a large adenoma calls for partial thyroidectomy; a cyst is tapped and injected with carbolic acid or emulsion of iodoform, and if this proves futile, it is enucleated. Malignant disease requires complete thyroidectomy; exophthalmic goiter will do best if treated surgically. L. R. Regnier² points out that the success which attends surgical treatment of exophthalmic goiter has diverted attention from the great **value of the constant current**. He thinks that this should always be borne in mind as a valuable resource in the treatment of these difficult cases.

DISEASES AND FRACTURES OF BONES.

J. O. Symes³ reports a case of **bone abscess** of 7 years' duration, due to the **typhoid bacillus**. This patient had had an attack of enteric fever when 18 years of age, and during convalescence suffered from pain in the left tibia. Some pus was evacuated and the wound healed, but another collection of pus formed, and from time to time there were discharges from the wound, until 2 years previous to the present operation. This patient was 25 years of age on admission to the hospital, and there was much tenderness, as well as some swelling of the upper portion of the left tibia. An abscess cavity containing a small sequestrum was discovered, and cultures of the pus showed typhoid bacilli. That it was the typhoid bacillus was placed beyond doubt by the fact that, when tested with the blood of several typhoid patients, broth cultures were immediately clumped. The patient's blood gave the Widal reaction. [It has been pointed out that in a number of cases in which a sinus has existed for months, or even years, pure cultures of typhoid bacilli have been obtained ("The Surgery of Typhoid Fever," by W. W. Keen).]

¹ *Medicine*, Nov., 1899, p. 881.

² *Progrès méd.*, Feb. 10, 1900.

³ *Practitioner*, April, 1900.

George Henry Eddington¹ reports the case of a woman of 45 who complained of numbness and peculiar sensations in the tip of one of her fingers. Examination showed a cicatrix on the palmar aspect of the terminal phalanx. This cicatrix, apparently by implicating digital nerves, was the cause of the symptoms, and it had resulted from a whitlow which had been incised 20 years before. She stated that at the time of that operation a material like a clear jelly was evacuated. Eddington accepted this statement with reserve, but within a few days after this he had occasion to open a swelling around the matrix of the finger-nail of a woman aged 79; gelatinous material escaped through this incision, the fluid possessing the characteristics of the fluid of a simple ganglion. The patient said that the swelling had never been very painful, that it had been present for 3 months, and that it was not increasing. There was little or no redness of the skin and no tenderness, and fluctuation was distinct. Examination of the fluid showed that it contained much mucin and degenerated cells of flattened form, with here and there cocci. This disease is a condition which has been described by Garré; it is a form of acute **infective osteomyelitis**, in which there are serous or mucous contents in a supposed subperiosteal abscess. The condition is termed *periostitis aluminosa*. It was first described by Poncet, in 1874. There are very few cases on record. Some hold that the inflammatory process is not sufficiently intense to form pus; others, that the jelly is a degenerated pus. It may be that the staphylococci have a modified virulence at the time of infection. [In some cases the fluid lies beneath the periosteum; in others, upon the external surface; in still others, within it as a cyst. In the fluid of periostitis aluminosa pus cocci are found, and it seems probable, as Schlange suggests, that cocci of lessened virulence produce an inflammation which does not pass beyond the stage of serous exudation. The condition is certainly not tubercular, and necrosis of the bone often coexists with it.]

Harvey W. Cushing² discusses the method of treatment for the **restoration of the entire tibia**, necrotic from acute osteomyelitis. The indications for treatment in cases of acute osteomyelitis are, according to Cushing: "(1) To save the patient's life and relieve pain by immediate operation to establish free drainage. The medullary cavity should be opened, pressure relieved, and infection checked. (2) If the bone is killed, as it usually and rapidly is in a few days, it should be removed. (3) The most favorable time for its removal is when the periosteum and granulation tissue is in its most active regenerative stage, but before the process of calcification of the bone trabeculae has shut the sequestrum within a compact, dense shell of involucrum. (4) This point is to be determined by frequent examinations of sections of the periosteum with the microscope. It is shown by the presence of numerous fibroblasts, osteoblasts, and small trabeculae in which lime salts are beginning to be deposited. (5) Clinically it can be recognized by the slight crackling sensation as the periosteum is incised, due, probably, to

¹ Brit. Med. Jour., Oct. 21, 1899.

² Ann. of Surg., Oct., 1899.

the crushing of the trabeculae by the knife. (6) The periosteum at this stage resembles granulation tissue in color, density, and vascularity. There is no macroscopic appearance of ossification. Bone will be formed from this elastic, flexible, periosteal layer. (7) This stage was probably reached in the seventh to eighth week of the disease. (8) At this stage the necrotic bone should be removed by incising the periosteum in the long axis of the leg and shelling out the sequestrum. (9) The periosteal sheath remaining should be closed by suture, leaving a solid cord or mass of periosteum buried in the center of the leg when in its most active bone-producing condition. (10) If areas of calcification of any extent or thickness are found adherent to the inner surface of the periosteal sheath, they should be dissected off. (11) The soft parts and skin superjacent can be closed by suture. (12) The utmost care and most efficient means should be used to render the operation an aseptic one, for primary union is important. (13) The new bone is formed rapidly, apparently in 18 to 24 days, when the operation is done at the time above indicated. At this time ossification is so advanced that the new bone is rigid. (14) If the operation is done too early, the growing periosteum is injured apparently and its growth is interfered with. (15) If too late, a rigid bony involucrum makes the removal of the sequestrum more difficult and forms a cavity which is very difficult to close. (16) It is demonstrated by the radiograph that the medullary cavity is reformed in the new bone. (17) The shaft of the bone is easier to restore than the epiphysis."

W. F. Dearden¹ writes on **fragilitas ossium** among workers in **lucifer match factories**. It is a well-known fact that there is a liability among these workers to necrosis of the jaw, but this is not the sole pathologic condition incident to the occupation. It is highly probable that constant exposure for a considerable period to the action of phosphorus leads to change in the osseous tissue throughout the body. The author reports the cases of two dippers, each of whom has had separately and at different times both thigh bones broken from a very slight amount of force. It was pointed out a number of years ago that among workers in phosphorus the long bones may be easily fractured. In Dearden's second patient, 6 months after the second fracture of the thigh the distal phalanx of the right forefinger was lost by an accident. The bit of bone removed was secured and studied, being compared with a corresponding bone from an individual of the same age. The relative proportion of phosphoric acid to lime was distinctly greater in the dipper's bone than in the healthy bone. It seems probable that this excess of phosphoric acid combines with the preexisting neutral phosphate of lime to form a slightly acid salt. It seems likely that the formation of acid phosphate of calcium in bone is the explanation for this peculiar fragility.

Arthur L. Chute and E. H. Bradford² read a paper before the American Orthopedic Association on **nontuberculous infectious processes in bone**. The general name osteomyelitis is given to these con-

¹ Brit. Med. Jour., July 29, 1899.

² Phila. Med. Jour., Oct. 14, 1899.

ditions. The disease is very rarely met with in the aged, is rare in adults, common in infants, and particularly common in young children. It is known that osteomyelitis is not the simple disease it was formerly thought to be: *i. e.*, it is not a condition due only to the *Staphylococcus aureus* or *Staphylococcus albus*. We know that it may be caused by the streptococcus, the bacillus of typhoid fever, the pneumococcus, the colon bacillus, the *Staphylococcus citreus*, and the *Bacillus pyocyaneus*. With regard to the method of infection, two conditions must be present: a region of lowered resistance and an avenue of infection. The region of lowered resistance may be brought about by an injury, by exposure to cold, or by the existence of some disease. The infection is carried by the blood stream, and as in the leg the nutrient arteries run toward the joint, we find that the lesions are most common in the upper end of the tibia or the lower end of the femur. The lower limb is affected more frequently than the upper, probably because it more often receives blows. In the upper limb the infection also travels in the direction of the blood stream, so the head of the humerus and the lower end of the forearm are the common places. No bone is exempt from infection. The exanthemata, tonsillitis, scarlet fever, typhoid fever, or pneumonia may furnish the point of least resistance by lowering the general health, and may also supply the infecting organism. The source of infection is often a slight external wound or abrasion which has become septic; for instance, a blister caused by a badly fitting shoe. In the new-born the stump of the umbilical cord is a common channel of infection. The lesions of various gastro-intestinal disturbances, bronchitis, ophthalmia, otitis media—all have acted as a port of entry for the micro-organisms. Micro-organisms are deposited in the marrow from the blood. Toxins are produced which cause necrosis of the surrounding cells. There is an exudation of leukocytes, distention of the vessels, and some hemorrhage, and this process may continue up or down the shaft. If in the medulla, the suppuration often continues through the Haversian canals, strips the periosteum from a considerable area of bone, and leads to thrombosis of the vessels of the bone. The epiphyseal line is a barrier to the progress of the disease. The authors then discuss the symptoms, the diagnosis, and the prognosis, say a few words as to treatment, and report a number of interesting cases.

R. Glasgow Patteson¹ advocates **suture of the fractured patella** by an improved method. He uses silver wire as a suture material; drills each fragment in one place only; uses D-shaped wire, No. 16, of the softest silver, flat on one surface and broad, free from the tendency to cut through the drill-hole, and strong enough to permit of but a single suture being used. He considers that in young and healthy subjects the ideal operation is primary suture, and that if this is carefully applied, it is not more dangerous than many of the so-called subcutaneous sutures, while it is much more efficient. The operation should be delayed for a few days after the accident, in order to permit the more acute joint symptoms to subside. The joint should be thoroughly freed from clots

¹ Brit. Med. Jour., Feb. 3, 1900.

and the broken surfaces of the bone should be carefully cleared. The fibrous curtain between the fragments should be elevated, but not resected, and should be subsequently sutured over the embedded wire. Passive motion should be begun early. In the case which the author reports he removed the splint and began passive motion on the fifteenth day, and a few days later he got the patient about on crutches. Vallas,¹ in an article on the operative treatment of fracture of the patella, maintains that the suture of the fibrous capsule is as necessary when operation is performed as is the suture of the bone. Suture of the fibrous capsule alone is preferable to suture of the bone alone, but both these proceedings can be carried out together. A fracture of the patella accompanied by tearing of the fibrous tissue about the bone must be treated surgically. The preferable operation is to open the joint, free it from clots, and suture the torn capsule without suturing the bone. If there is a separation of $\frac{3}{4}$ of an inch or more when the limb is extended, there must be rupture of the lateral prolongations of the capsule, and such a case must be operated upon. In some cases, however, in which these lateral prolongations are torn there is not this degree of shortening; hence it is well, before determining what to do in a given case, to wait 3 or 4 days.

J. S. Wight² reports 2 cases in which there was **simultaneous fracture of the patellas**. These cases were treated by wiring the fragments. Wight did not operate until 2 weeks or more after the accident. The object of the delay was to permit of the absorption of extravasated blood and the regaining of the tissue tone. If this is done, there is much less danger of infection and much more rapid repair. If both patellas are broken at once, they should be wired; failure to do so will be followed by serious disability—a disability so great that the individual will probably be unable to support himself. The author prepares the field of operation during 3 or 4 days; makes a vertical incision; saws off the ends of the fragments; drills the lower fragment from below and in front, upward and backward, and the upper fragment from above and in front, downward and backward—the drill in each instance coming out just in front of the posterior surface of the fragments. The drill has an eye in the point; a wire suture is inserted in this eye, and when the drill is removed, it pulls the wire through the drill-hole. The ends of the wire are twisted, cut off, and bent down upon the bone. The wound is sutured, drainage being used for 2 or 3 days. A posterior splint is applied, and the limb is placed on an inclined plane. J. N. Henry³ reports the case of an individual who suffered from two separate fractures of the same patella at an interval of 8 months. It was impossible to identify and prove the two fractures except by use of the skiagraph. The person had sued the city for damages, claiming that the first fracture had weakened the bone and that the break had occurred in the old line of fracture, but the skiagraph showed that the break was in an entirely new position. [In a case recently observed in the

¹ Rev. de chir., Oct., 1889.

² Phila. Med. Jour., Jan. 6, 1900.

³ Am. Jour. Med. Sci., Aug., 1899.

hospital of the Jefferson Medical College a second fracture occurred 10 months after the first. The first fracture had been near the middle of the bone; the second fracture was $\frac{3}{4}$ of an inch nearer the lower end of the bone. The first fracture was seen soon after treatment in another hospital. The second fracture was treated in the Jefferson Hospital. The fracture was clearly demonstrable, and was also observed by means of the x-rays. An Agnew splint was used and an excellent result was obtained. There was a considerable production of new bone and there is apparent bony union.]

Mr. Arbuthnot Lane¹ writes on the subject of **fractures**. He maintains that, except in a few cases, the surgeon is unable completely to correct a deformity. The opposition to restoration is not due to the muscular contraction, but to the surrounding soft parts acting as ties on the long axis of the bone. Hemorrhage takes place into the soft parts, inflammation ensues, they become rigid and unyielding, and, except in a few transverse fractures, the only way in which a deformity can be completely reduced is by operation. When the fracture is exposed, great traction, with the use of elevators and forceps, will bring the bones together. In fractures of the tibia and fibula it is very difficult to correct deformity, even when there is a wound, because the bones are broken in a spiral line, the edges of which are sharp. If the ends are comminuted, restoration will be very difficult.

C. H. Golding-Bird² delivered a clinical lecture on the **riding fragment in fracture of the leg** and pointed out the value of operative treatment in simple fracture. This is an article of great practical value, but too lengthy to admit of being thoroughly abstracted. Golding-Bird warns us against a danger in skiagraphy, and speaks of a case in which a patient had his limb skiagraphed after it had been properly treated, and because the picture showed a slight irregularity, he went from surgeon to surgeon in order to gather up enough criticisms to enable him to sue for damages. Few fractures will thus bear the test of skiagraphy; so do not appeal to it in your own work as a proof of the success of your treatment, for you will be liable to be called to account because the bone is not so perfect in appearance as it was before the accident, although the utility of the bone is in nowise impaired. It is not proper to operate in simple fracture merely to satisfy the demands of skiagraphy. There are two great gains that result from operation: (1) the more certain adaptation and fixation of the ends of the bones in fractures of peculiar shape, and (2) an effect similar to that produced by massage. The author says that when both bones of the leg are broken, the fibula is the great opponent to the restoration of the tibia in the normal line; and when in an oblique fracture of the tibia one fragment seems to ride over the other and is difficult of replacement, it is the fibula, rather than muscular spasm, which is the cause. Muscular spasm has little to do with the riding fragment, because even under chloroform the fragment frequently can not be replaced; and, further, this can not be attributed to the bone-perforating fascia or muscle, for when operating and freeing the bones

¹ Edinb. Med. Jour., Sept., 1899.

² Brit. Med. Jour., April 21, 1900.

entirely from their connections, the same difficulty of replacement often remains. The author then discusses modes of fracture and spiral fractures, and points out that the difficulty of replacement in fractured tibia is often due to the fact that the fracture is spiral. He then mentions the indications for operation in simple fracture.

B. Farquahar Curtis¹ writes on **fracture of the neck of the humerus** with dislocation of the upper fragment, and reports 3 cases treated by operation. His conclusions are as follows: "(1) In fracture of the upper end of the humerus with displacement of the upper fragment from the glenoid cavity, when proper attempts at simple reduction under general anesthesia have failed, operative measures should be resorted to unless shock, other injuries, or extensive damage to the soft parts about the shoulder justify delay. A delay of from 2 to 4 weeks will not impair the result. (2) Anterior displacements require an anterior incision; subglenoid or posterior displacements require a posterior incision, preferably by Kocher's method. (3) The head should be restored to its place, if possible, and resection resorted to only when reduction is impossible or would require such extensive damage to the parts, or such prolongation of the operation, as to increase the dangers of wound infection or of shock. (4) Resection will probably give a better result in fracture of the anatomic neck than in that of the surgical, but reduction is to be preferred in both cases. (5) Asepsis is an indispensable requirement for a good functional result, and these operations must not be undertaken except under aseptic conditions. (6) Motion should be begun in the joint as soon as the wound has healed, in 10 to 14 days after the operation."

Martin W. Ware² insists upon the value of what he calls the cardinal **pathognomonic sign of fracture of the lower end of the radius**. Silver-fork deformity is exceptional in Colles' fracture. In the normal wrist the styloid process is on a lower level than the styloid of the ulna. If a line is drawn between these two points when the hand is prone and on the same plane as the bones of the forearm, it will take an oblique course toward the radial side. When there is a fracture of the lower end of the radius, the styloid processes become more nearly level, or, in other words, the radial styloid is distinctly elevated. [Ware's test is valuable. The symptom is an invariable one. He is undoubtedly correct in his statement that silver-fork deformity is often slightly marked or even absent.] Carl Beck,³ of New York, writes an elaborate article on fracture of the lower end of the radius, and insists upon the great value of skiagraphy in making the diagnosis. This article is illustrated with a number of excellent skiagraphs.

J. Lyman Thomas⁴ maintains that the styloid process of the ulna is fractured in over half the cases of **Colles' fracture**, this statement being proved by skiagraphs.

Pluyette⁵ reports a case of **simultaneous fracture of both clavi-**

¹ Ann. of Surg., Mar., 1900.

² Med. Rec., Mar. 31, 1900.

³ N. Y. Med. Jour., Sept. 9, 1900.

⁴ Brit. Med. Jour., Oct. 28, 1899.

⁵ Bull. et Mém. de la Soc. de Chir., No. 22, 1899.

cles. He does not consider that such an injury is very rare, and has succeeded in collecting 40 recorded cases. This accident is most usually met with in adult males, and it is generally produced by forcible compression of the upper part of the chest from side to side. There is marked overriding of the fragments and the shoulders pass a considerable distance downward and forward. The use of both upper extremities is completely lost and there is generally dyspnea, due, in part at least, to the weight of the two upper extremities resting on the thorax, and in part to loss of resistance in portions of the upper extremity to which respiratory muscles are attached. There is but one death on record from this injury. In many of these cases an incision should be made over each clavicle and each bone should be sutured. Severe dyspnea positively calls for operation. In the case reported in this paper the left clavicle was operated upon 11 days after the injury, and the right clavicle 4 weeks after the first operation. As a matter of fact, however, as Guinard shows, nonunion is not common after bilateral fracture, even when no operation is performed.

Charles L. Scudder¹ discusses the open or **operative treatment of fresh fractures**, and gives an analysis of the results of the present method of treatment in 150 fractures of the lower extremity.

Charles L. Scudder² writes upon the **surgery of the epiphyses**. Many epiphyseal separations are mistaken for fractures, and the Röntgen rays are revealing the lesions which occur after traumatism of joints. With perfection of diagnosis comes the obligation to correct deformity and to secure greater functional usefulness. This obligation leads to the open incision of many fractures and epiphyseal separations. Scudder calls attention to Poland's book upon traumatic separation of the epiphyses, and recommends it strongly. He reports 4 cases of surgery of the epiphyses.

Lewis W. Steinbach³ advocates the use of **fixation plates in the treatment of ununited fractures of the leg**. He uses a silver plate in the form of a cleat, which is applied to the flat subcutaneous surface of the tibia and fastened by small galvanized steel screws. The plate is made of silver $\frac{1}{16}$ of an inch in thickness, $3\frac{1}{2}$ inches in length, and $\frac{3}{4}$ of an inch wide, with perforations for screws $\frac{1}{2}$ an inch apart. The integument should be separated from the bones, but the periosteum should not be disturbed. Serrations, bone spicules, blood-clots, interposed tissue, etc., are removed from between the fragments, the fragments are molded into position, the plate is adjusted, the drill is applied through some of the perforations, and the screws are inserted with the aid of an ordinary screw-driver. Two screws are usually employed at each end. After the integument has been sutured, the leg is placed in a fracture-box or a posterior splint of metal or felt. After a week, the limb may be placed in a silicate of sodium case, fenestrated over the plate, and over the drainage-tube, if one has been used.

Albert L. Bennett⁴ reports the results obtained in the treatment of

¹ Boston M. and S. Jour., Mar. 22, 1900.

² Ann. of Surg., April, 1900.

³ Med. News, Mar. 10, 1900.

⁴ Ann. of Surg., Mar., 1900.

ununited fractures with the **Parkhill clamp**, and bears strong testimony to the efficiency of this treatment.

Potherat¹ reports cases of **ununited fracture** which consolidated during the administration of **thyroid extract**. He thinks that in certain cases of ununited fracture this treatment should be used. In some cases it has failed, but in the majority it produces distinctly beneficial results. It is most useful in cases of retarded union; less useful in actual nonunion. Of course, thyroid extract is an active poison, and might produce fatal results if carelessly used. [In 1895 Hamann and Steinlein pointed out that if the thyroid gland be removed from an animal, broken bones will be repaired very slowly. It has been suggested that the administration of thyroid will hasten the repair of ordinary fractures and thus lessen the duration of treatment. We have used thyroid in one case of delayed union with possible benefit, and in one case of ununited fracture with no benefit at all. Quénu and others believe that the plan is useful.]

JOINT DISEASES AND DISLOCATIONS.

F. A. Southam² writes on **excision of joints in rheumatoid arthritis**, and calls attention to Collinson's case of excision of both elbow-joints for rheumatoid arthritis, Howard Marsh's 2 cases of excision of the knee-joint, and the remarks of Bannatyne and Parker in advocacy of the operation. Some years ago Southam performed 6 excisions of joints in 3 patients who were victims of this disease. In 4 instances excision of the knee was performed, in order to correct a flexed and ankylosed position; and in 2 instances the elbow was excised, in order to substitute a movable for a stiff joint. In this paper Southam reports the records of his 3 cases; he believes the operation has a distinct field of usefulness.

Kirmisson³ writes on the treatment of **tuberculosis of bones and joints in infancy**. In most cases he is an advocate of a conservative plan of treatment. In contrast to joint disease in adults, the time occupied in treating these cases is not of serious importance; and children have great recuperative power and notable reparative energy after tuberculous processes, even if there has been suppuration and marked deformity. There is not the slightest question that abscesses, in connection with the spine in particular, may be absorbed spontaneously, and there is less liability to dissemination of tubercle in a child than in an adult. A child may, to be sure, develop tubercular meningitis, but tubercular involvement of the lungs is much rarer in childhood than in adult life. Kirmisson advocates opening abscesses and injecting iodoform; and he claims that resection of the hip in a young child is an extremely dangerous and uncertain procedure, and that the results, so far as the future usefulness of the extremity is concerned, are inferior to the results obtained by conservative treatment.

¹ Bull. et Mém. de la Soc. de Chir. de Paris, Dec. 5, 1899.

² Lancet, Dec. 9, 1899.

³ Bull. et Mém. de Chir. de Paris, Dec. 5, 1899.

John O'Connor¹ advocates the **surgical treatment of gonorrheal arthritis** in all cases, and reports 10 cases in which he successfully carried out this procedure. He says that the operation should be performed early, in order to save the joint structures from the harmful effect of immersion in a very destructive exudate. In his cases free drainage was secured, and in not a single case did sepsis arise or relapse occur. The patients were discharged with joints normal in contour and in function. [The difficulty in deciding promptly to apply this treatment is that so many cases of gonorrheal rheumatism are not serious and are recovered from without impairment of function.]

R. S. Fowler,² in describing a method for the **radical cure of hallux valgus**, advocates the operation which was devised by George R. Fowler. This operation is performed as follows: A knife is inserted into the sole of the foot $\frac{1}{2}$ of an inch to the proximal side of the metatarsophalangeal joint, and between the great toe and the second toe. It is brought out on the dorsum at the same level, external to the extensor tendon of the great toe, and the soft parts are completely severed in the web between the toes and parallel with the long axis of the metatarsal bones. The great toe is then strongly adducted, in order to stretch the external lateral ligament, this ligament is cut with the knife, and the joint is entered. The toe is then dislocated inwardly and a triangular-shaped portion of bone is taken away, including the hypertrophied part of the head and a portion of the articular surface. Sometimes after this operation the deformity tends to recur, because of contraction of the extensor tendon; and if recurrence takes place, this tendon should be lengthened.

Ollier³ maintains that in certain cases of **intractable arthralgia** the proper treatment is resection of the joint. The surgeon must be careful before deciding to perform so radical an operation, because in many of these cases the condition is obscured by the presence of hysteria. Ollier has resected the shoulder in two cases and the knee in two. In every case, when the joint was opened it was impossible to find a lesion which was explanatory of the severe pain. In one case in which the pain had attacked the shoulder after a traumatism, the bone was found to be healthy, but the cartilage was congested. The operation completely relieved the pain and a functioning joint remained. Seven years later the patient died of tuberculosis. In two other cases the condition apparently originated in a slight injury, and in the fourth case it followed rheumatism.

L. W. Ely⁴ points out that the **early recognition of tuberculous disease of a joint** is of the first importance, but is often extremely difficult. A good history must always be obtained; the exact beginning of the process can rarely be fixed, and the evolution is usually gradual. It grows worse, with occasional temporary ameliorations, and not unusually there is a history of antecedent injury. Two very important symptoms are pain and stiffness. The pain is rarely limited to one definite

¹ Lancet, Dec. 9, 1899.

² Rev. de chir., No. 9, 1899.

³ N. Y. Med. Jour., Dec. 16, 1899.

⁴ Med. Rec., Dec. 16, 1899.

spot ; it is usually in a certain region. It is aggravated by motion ; and at night, when the muscles which hold the joints are relaxed, it often comes on in paroxysms. In examining a patient, have him strip ; observe first the attitude, next the deformity, and then any alteration in the contour of the joint. The joints most prone to tuberculosis, in the order of frequency, are : the spine, the hip, the knee, the ankle, the elbow, the wrist, and the shoulder.

David M. Greig¹ discusses **temporomaxillary ankylosis** and its relief by excision of the neck and condyle of the lower jaw. This condition has received but scanty attention from medical writers. Fixation of the jaw may be temporary or permanent. The former condition may depend upon tetanus, reflex irritation of the muscles of mastication, or inflammation of the parotid gland. In this article the author considers only the permanent form. Permanent fixation is ankylosis, and may be due to extra-articular or intra-articular causes. The causes may be classified as follows : (1) Traumatic. This may be extra-articular, if there has been loss of tissue with subsequent cicatrization ; or it may be intra-articular, from fracture or contusion followed by arthritis and the formation of adhesions. (2) Nontraumatic. Nontraumatic ankylosis may be suppurative. If the suppuration be extra-articular, the ankylosis is due to tubercular or septic inflammation about the joint, with the formation of adhesions. If the ankylosis be intra-articular, it may be caused by a true arthritis, probably tuberculous, originating in the joint ; or the joint may be affected secondarily. The arthritis may be pyemic, may follow suppurative parotitis, or, as is most common, may be set up by the virus of otitis media passing into the joint through the Glaserian fissure. Nonsuppurative cases may be produced by osteo-arthritis, or, more rarely, by urethral arthritis. It must be borne in mind that rigidity of the joint may result from injury to the temporal muscle, or of such injury to or periostitis of the coronoid process as to produce immobility. The result of these conditions is ankylosis, either osseous or fibrous, at the joint or the coronoid process, unilateral or bilateral. It is often difficult to decide which joint is ankylosed and whether the condition is unilateral. In reaching a conclusion one is influenced by the presence of cicatrices, by thickening about the joint (felt externally or from within the mouth), and by the existence of diminished hearing on one side. Sometimes it is impossible to say which side is affected, and then both sides must be prepared for operation. In time, after fixation of the jaws the lower jaw becomes smaller, the angle becomes more obtuse, the chin slopes inward, and the muscles atrophy and become fatty. The patient feeds himself by forcing solid food into the mouth between the teeth or through spaces where the teeth have been broken or removed ; and partly because of these proceedings, and partly from attempts to lever the jaws apart, the dental arches are displaced and the front teeth are directed somewhat forward. The only operation worth considering is excision of the neck and condyle. The operation is performed as follows :

"The incision commences above, on a level with the upper margin

¹ Practitioner, Dec., 1899.

of the orbit, just over the temporal artery, which can easily be felt pulsating. It is carried downward and slightly backward until it reaches the zygoma, a finger's-breadth in front of the external auditory meatus. It is then continued directly downward until it reaches the level of the anterior attachment of the lobule. The incision includes the skin and the superficial and deep fascias, and this flap is then reflected downward and forward. The auricular arteries of the superficial temporal are divided. The auriculotemporal nerve remains untouched behind the incision, while the temporal artery and the upper branches of the temporo-facial division of the facial nerve, except perhaps a few fibers to the occipitofrontalis muscle, are carried downward and forward in the flap. It is sometimes necessary to divide the superficial temporal artery at the upper end of the incision, and, if so, it is better secured with a suture than with a ligature, as the superficial fascia here is rather dense, and the ligature may be rubbed off in subsequent manipulations. This flap then having been freed as far as the lower border of the zygoma, the masseteric fascia is freely divided along the margin of the bone, and it, with the parotid, is pulled downward and forward also. This is a transverse incision, but a vertical notch may be made also, if necessary, to allow of freer manipulation. The knife is now entered below the zygoma and carried down to the condyle, and thence a vertical incision is carried through between the fibers of the masseter muscle as low as the lowest level of the sigmoid notch, and the muscular fibers are separated with a periosteum elevator. Guided by this instrument, a chisel is now conveyed down to the bone. The chisel is next lateralized at the lower angle of the incision, and the neck of the bone is cut through obliquely from below upward, the anterior part being cut at the lowest level of the sigmoid notch. It is, I have found, important that the bone be chiseled through at its lower limit first, because it is below the level of the internal maxillary artery, but chiefly because the bone is, in a way, pyramidal, and it is easier to cut through the base of the pyramid after the apex has lost its support by separating it from the rest of the jaw. The chisel is then applied at the site of the joint and the base of the pyramid is divided. The loosened portion is then driven forward into the wound with forceps and the external pterygoid muscle is cut loose. If now the ankylosis be unilateral, it will be found quite easy to separate the dental arches; but if this can not be done, the chisel is slipped forward across the sigmoid notch and the coronoid process is divided. There is no bleeding. The wound is stitched up, and no drainage is required. I employ a chisel to divide the bone, because it is more easily managed and more accurately regulated. It is impossible to use a pair of bone forceps in dividing the bone below without unjustifiable injury to the tissues, because the wound is not large enough to admit a sufficiently strong pair. A chain-saw is out of the question, on account of the difficulty in passing it, and because of its tendency to slip upward. One of our best manuals on operative surgery recommends that after the bone is divided below, the upper part be twisted out with necrosis forceps. If the wound is large enough to admit such forceps, the proceed-

ing may be possible if the union be fibrous, but it is quite impossible if the ankylosis be osseous."

B. G. A. Moynihan¹ describes the **joint affections of gonorrhea**. He adopts the classification of König, who recognized 4 forms: (1) Hydrops, (2) the serofibrinous form, (3) empyema, and (4) phlegmonous inflammation. This classification is pathologic, and not clinical. Although all gonorrheal inflammations begin acutely, the majority of them run a very chronic course, and it is a notable fact that the complaints of the patient seem out of proportion to the severity of the local condition. The diagnosis of gonorrheal arthritis is suggested when there are loud complaints of fearful suffering and but trivial evidences of alteration in the joints or the periarticular structures. This last point is one which has not previously been emphasized. Hydrops is the mildest form. A patient with a slight attack of gonorrhea observes that his knee is swollen; there is no fever, little pain or tenderness—simply an increase in the circumference of the joint. The capsule is not thickened and there are no evidences of inflammation in the skin. In such a case the effusion usually disappears quickly, and recovery takes place in a few weeks, without permanent disablement. So far as the author knows, this variety has been observed only in the knee-joint. The serofibrinous form and empyema are advanced and violent conditions of inflammation. In hydrops the joint contains a thin, pale, nearly clear, yellowish-green effusion; in the serofibrinous form the fluid is thicker, is turbid, and contains shreds and masses of fleecy lymph. The turbidity increases, and finally pus is formed. The capsule of the joint becomes thickened and swollen, the joint is hot to the touch, even slight motion produces exquisite pain, and there is distinct swelling and redness. The masses of lymph may eventually cause adhesion in the joint, and then a permanent ankylosis, more or less firm, results. The general health of the patient rarely suffers severely. The phlegmonous form is the most serious. There is a small effusion of very turbid serum or pus; but fluid may be actually absent, the joint being filled with masses of jelly-like fibrin. The inflammation is intense, and extends beyond the joint capsule, and the capsule and the periarticular structures become fused together into one inflammatory mass. The skin is red, tense, shining, and edematous. The contour of the joint fades away. The pain is torturing and the tenderness is excruciating, and there is rapid and severe muscular wasting. The joint is quickly disorganized, and within 2 or 3 weeks dislocation may occur. When the process subsides adhesions form, and ankylosis ensues. In the knee-joint the patella is apt to adhere to the lower end of the femur. In this form abscess formation, in spite of appearances, is unusual. The acute condition may subside and pass into an extremely chronic state. Several joints may be affected simultaneously, or nearly so, with aching, boring pain, difficulty of movement and slight limitation, but without obvious physical change. The flying pains are sudden in onset, capricious, and evanescent, and one joint becomes more acutely affected with one of the varieties of inflam-

¹ Lancet, Nov. 13, 1899.

mation previously described. In the later stages of gonorrhea there may be any of the joint affections just noticed, but it is more usual to find two or more joints affected, the inflammatory process being different in intensity in each articulation. The disease is, in fact, polymorphous. One joint may be affected with hydrops, another with phlegmonous inflammation, etc. It is especially in the later stage of gonorrhea that inflammation of serous membranes occurs—pericarditis, pleurisy, etc. The main principle of treatment is rest. Mercury and iodid of potash, the latter being given in large doses, do good. Evaporating lotions or tincture of iodine may be applied to the joint. French surgeons advocate incision, and in severe cases this procedure may be of use. If the joint is very tense and the pain very severe, relief is promptly obtained by incision and washing out the joint with an antiseptic fluid. The most serious feature of all forms of gonorrheal arthritis is the strong tendency to ankylosis; hence the inference is that, in the course of treatment, rest must not be too long continued, and passive movements must be employed much earlier than in other joint troubles. The joints of the lower extremities suffer twice as often from this disease as the joints of the upper extremities. Practically any joint in the body may suffer, but the knee is attacked most often, the hip next, and the elbow next. In 27 cases in which the joint effusion was examined the gonococcus was discovered in only 8, and the inference is that the infection is a mixed one.

Joseph B. Bloodgood¹ advocates **early exploratory operation in tuberculosis of the hip**, and reports a series of cases in which he has carried out this procedure with rapid cure. For some time he has had it in mind that it would be proper to make an early exploratory operation and endeavor to find the focus of the disease in the bone at a period when its complete removal would be possible; or, if the tubercular osteomyelitis is more extensive, when a partial excision would be possible, without interfering with the continuity of the bone or the function of the joint. Experience shows that in the knee arthrotomy, with irrigations with antiseptics and injections of iodoform, has been the best procedure for the treatment of tuberculosis of the synovial membrane. His first object in the early operation for tuberculosis of the hip was to avoid a complete removal of the head or of an amount of bone sufficient to interfere with the continuity of the upper end of the femur and with the function of the joint; to excise diseased bone only in small areas by the use of a gouge and to trust to antiseptic irrigation and the healing process to prevent the further extension of the disease; and to encourage the repair of the tissues already diseased. The more often one operates and the earlier, the more frequently may one succeed in finding a single focus of tubercular osteomyelitis, which can be completely excised without injury to the bone or joint. As his experience grows, the author trusts he may find that early operation checks the disease more certainly and more often than the usual orthopedic treatment, and also that it shortens the

¹ Johns Hopkins Hosp. Bull., Jan., 1900.

period of treatment. In 5 of his cases the joint capsule was greatly distended, and it seems certain that in such cases arthrotomy and irrigation form the only reasonable treatment. The tension is thus lessened and the tissues are relieved of pressure, thus becoming better able to repair the tubercular process. The arthrotomy allows of local disinfection of the surface of the capsule and bone, and with a small gouge one is able to explore the trochanter and the neck and head of the femur, without endangering the continuity of the bone. Any focus of diseased bone can be partly or completely excised. Loose articular cartilage on the head of the femur and on the acetabulum can be removed, and the diseased bone can be disinfected. In many cases of tuberculosis of the hip synovitis with effusion is present early, and in a number of cases the capsule ruptures and extra-articular abscesses form. An anterior arthrotomy, if performed before rupture, will prevent this complication. In 3 cases extra-articular abscesses were present at the time of operation. The joint capsule in these cases was not distended, but in each case it was perforated. In addition to the incision of the abscess, the joint was opened by the usual anterior incision and drained. The wall of a cold abscess connected with tubercular bone is composed of ordinary granulation tissue. It is not necessary extensively to excise the abscess wall, as this wall seldom shows evidences of tuberculosis. The most important element in the treatment is the removal of the source of infection in the bone; therefore, after opening and disinfecting an abscess about the hip, explore the joint and search for the focus of tubercular osteomyelitis. Anterior arthrotomy of the hip is a simple operation. More extensive experience will be necessary before we can judge of the risk of infection, but there has been no infection in the 12 cases operated upon in the Johns Hopkins Hospital. The anterior incision is not a new one. It has been described by Mr. Barker as "Parker's operation." The acetabular cavity can be explored after opening the joint by passing gouges through the head, but extensive operations on the acetabulum should not be performed without removal or temporary dislocation of the head of the bone.

Howard Marsh¹ considers the present use of **excision of the knee-joint**. He says that with few exceptions the cases suitable for excision are adults and adolescents, in whom the growth of the limb is complete or nearly so, and whose bones are of such firm structure that after the operation they undergo an unyielding synostosis. These cases may be arranged in groups. *Group 1:* Cases in which the joint has become fixed in deformity. The majority of these cases are tubercular, but others result from septicemia, etc. In this group the operation is performed purely to remove deformity. *Group 2:* Those cases in which the joint is incapacitated by incomplete fibrous ankylosis, the cause of the condition being tuberculosis or septicemia. In the tubercular cases the synovial membrane, ligaments, and cartilage have been destroyed and replaced by fibrous tissue, which limits, but does not absolutely prevent, joint movements. As a consequence the joint is irritable, and becomes

¹ Lancet, Nov. 18, 1899.

painful when the adhesions are stretched by movement, and this irritation prevents the patient from following any active employment. In other cases the disease begins in the articular end of the femur or the tibia, and the tubercular area in the immediate neighborhood of the joint acts as an irritant. In other cases the joint has been gradually destroyed by quietly advancing tubercle. In septicemic cases the condition is partial fibrous ankylosis. *Group 3:* This comprises a series of cases in which excision may be necessary. In these cases a little-known process causes inflammation of, it may be, a number of joints, one after another; these joints become greatly inflamed, a little warm, somewhat painful, and in most cases they will become fixed by complete bony ankylosis—and fixed in flexion, unless this has been prevented by the use of splints. In some cases so many joints are involved that it would be useless to correct the position of the knees; but when the knees only are involved, excision may be advisable. *Group 4:* When, as a result of osteo-arthritis, extensive structural change has taken place in the knee-joint, excision may occasionally be performed. It may be performed if the ligaments are relaxed and the joint is flail-like, and in cases in which the leg is flexed at a marked angle of fixation. Of course, if the patient's general health is much impaired, or if other large joints are in a like condition, excision is contraindicated.

William H. Bennett¹ makes an elaborate study of **internal derangements of the knee-joint**,—popularly called slipped cartilage,—based upon a series of 200 cases. The symptoms usually supposed to indicate the lesion are as follows: Sudden pain, associated, it may be, with a sense of something having slipped out of place; complete fixation of the joint, or at least limitation of the power of extension of the leg; these symptoms being followed by joint effusion and tenderness of one of the semilunar cartilages. The symptoms may occur during some ordinary and easy movement, but they may arise when there has been a violent twist or a sharp blow. The most usual causative movement seems to be rotation of the leg upon the thigh. Spontaneous reduction may almost immediately follow the injury, or reduction may be effected by manipulation. In some cases, however, manipulation not only fails, but appears to increase the trouble. The books state that in marked displacement of a semilunar cartilage, the structure can be palpated; but these cases are very few. Often some fullness can be felt along the edge of the cartilage, but, as a rule, this is mere swelling from blood extravasation, or inflammatory exudate, and it is not a sure sign of displacement of the cartilage. The only positive sign is a deficiency noticed upon comparing the two limbs. This deficiency is felt above the head of the tibia on the affected side, when there has been displacement of the cartilage inward. Projected thickenings are no evidence of cartilage displacement, because any loose body fixed between the bones may give rise to the same alteration in contour. While these symptoms are so distinct and clear, the causes are by no means always the same, and the symptoms may be produced by: (1) Displacement of a semilunar carti-

¹ Lancet, Jan. 6, 1900.

lage ; (2) the nipping of portions of synovial membrane between the bones ; (3) loose bodies in the joint ; and (4) bruising of the peripheral margin of a semilunar cartilage and its attachments, without displacement or loosening, the result of the injury being effusion of blood and inflammatory exudation, a portion of which, being between the ends of the two bones, acts as a foreign body. In the majority of milder cases of so-called slipped cartilage the real condition is contusion of the cartilage, and a contusion is easily curable by proper treatment ; but if unnoticed or neglected, it may lead to an intractable condition. The essential symptom in all cases of so-called slipped cartilage is the fixation of the joint, or at least the limitation of the movement. If the foreign substance be a portion of semilunar cartilage, a loose body, or a fold of synovial membrane, the symptoms, although marked, disappear at once after reduction has been effected, and the movements of the joint are immediately recovered. Now, there are many of these milder cases in which the limitation of extension can not be rectified by manipulation, and the patient does not become able completely to extend the limb ; and even under an anesthetic, it is not possible absolutely to straighten the leg. The failure to effect reduction in these cases is owing to the fact that there is nothing present which is reducible. If the case is treated properly, complete extension will be gradually regained—never suddenly, as when a foreign body has been withdrawn from between the bones ; and in these cases the symptoms are due to bruising and laceration at the peripheral margin of the semilunar cartilages and their attachments, without displacement. Treatment may be considered under three heads : (1) Treatment by temporary rest, massage, and regulated exercise ; (2) treatment by apparatus ; and (3) the operative treatment. In every case the first indication is to replace the structure which appears to be dislocated, if reduction has not been previously effected. The necessity of employing an anesthetic depends to some extent upon the nature of the case and the peculiarities of the individual. In a case in which the symptoms are exaggerated and the fixation is complete or almost complete, repeated attempts at reduction must be made if a single attempt fails. In the slight cases—those which Bennett considers to be due to bruised or lacerated cartilages or attachments—manipulation will not completely restore extension. In such a case a thorough attempt at reduction is made—it may be, under an anesthetic ; and if complete reduction is not thus effected, no further attempt need be made, as there is nothing to reduce. Persistence in efforts now will lead to severe traumatic arthritis. The treatment of all cases, whether they be those in which movement has been restored spontaneously or by manipulation, or whether they be of the group known as bruised cartilages, is complete rest for a time, by placing the joint in a splint and applying a lotion of hot lead-water and laudanum. This rest is maintained for from 4 days to a week, and exercise of any sort should not be employed until effusion has disappeared. Massage of the muscles and the joint, without movements, can not be begun too soon. Early massage hastens the disappearance of the fluid, prevents muscle waste, and obviates the tendency to relaxation of the joint cap-

sule, which is a common cause of failure in these cases. From the very first the limb is subjected to thorough daily massage without knee movements; and if circumstances admit, twice a day. Upon the disappearance of the effusion, which is usually within a week, passive movement is begun, care being taken that no rotary motion is imparted to the leg. The object of temporary fixation and massage is, first, to remove the fluid; and, secondly, to allow the loosened cartilage to fall back and adhere in its normal situation. The passive movements without rotation do not disturb the process of fixation of the cartilage and do prevent the formation of adhesions within the joint. Inflammation leads to fixation of the cartilage, and cases in which a somewhat acute inflammation follows immediately upon the injury are less liable to recurrence of loosening than those in which immediate inflammation is extremely slight. At the end of a fortnight the patient can begin to use his foot, the massage being continued, and at the end of 3 weeks the patient, who has been walking with a stiff leg, begins ordinary walking exercise. Massage is continued for from 2 weeks to 6 months, according to the case. The time for abandoning it is determined from the state of the muscles and of the capsule of the joint. It is not safe to dispense with it as long as the thigh muscles are wasted or the capsule is relaxed; and the latter condition, which is practically dependent upon the former, is the more important, as the wobbling of the joint associated with it may lead to recurrence of the trouble. The iliotibial band of fascia lata contributes greatly to the strength of the knee capsule. The elastic tension of this band is maintained by the gluteus maximus and the tensor fasciæ femoris muscles. In the majority of cases, when the knee capsule is relaxed these two muscles will be found wasted. Much attention is generally paid to the wasting of the quadriceps extensor; very little is usually given to the wasting of the other two muscles. But massage and exercise must not be limited to the obviously wasted quadriceps; they should be applied with equal vigor to the gluteus maximus and the tensor fasciæ femoris. With regard to treatment by the use of apparatus, little need be said. Apparatus should not be used unless it is absolutely unavoidable; and if treatment has been begun soon after the injury, apparatus will be needed only in very exceptional circumstances. The use of artificial support tends to make permanent the wasting of the muscles. In the following cases it is justifiable to use support: (1) Cases in which, for unavoidable reasons, the proper plan can not be carried out; (2) cases in which the rational treatment does not restore the normal tension of the capsule of the knee-joint, or those cases in which, in spite of careful treatment, abnormal lateral movement remains; and (3) cases in which attacks of semilunar displacement have occurred frequently, operative treatment having been rejected. If the symptoms point with reasonable clearness to the existence of a loose body, other than the displaced cartilage, a support is obviously useless and operation is necessary. If a support is used in any case of slipped cartilage, it should be constructed on sound principles. All ordinary knee-caps, elastic or inelastic, are to be avoided, because, more than any other contrivance, they increase the wasting of

the thigh muscles. The object of an artificial support is to prevent lateral movement at the knee-joint; to convert the knee, in fact, into the condition of a true hinge. All that the instrument will accomplish is to grasp the head of the tibia, with a view to preventing rotation. There are only two appliances which will effect this; one is complicated and expensive, and the other is simple and inexpensive. The small spring trusses sometimes applied are utterly useless. Regarding the propriety of removal by operation of a displaced semilunar cartilage, there is even now a difference of opinion. The majority of surgeons think removal the only practical plan; others think it unjustifiable. Bennett thinks that no operative measure short of removal of the cartilage is efficient, and that in some cases it is the only possible way of obtaining a workable joint. There is no defect in result after this operation because of the absence of the cartilage. The percentage of cases requiring operation is extremely small, and, speaking generally, operative measures should be postponed until all other treatment has failed. Operations will be limited, for the most part, to the removal of pedunculated bodies or synovial folds, and the semilunar cartilages will rarely require operative interference. In intractable cases of knee-joint trouble exploratory operation is obviously desirable, because it is very often impossible otherwise to determine what the trouble is; but considering the large percentage of cases curable without operation, explorations, he thinks, should be reserved for: (1) cases in which nonoperative treatment has positively failed to cure or radically to modify the symptoms; (2) cases in which relaxation of the joint is in excess of any other symptom; (3) cases of expediency, in which an attempt at relief is urgently necessary, but in which special circumstances call for extreme measures (for instance, if the physical defect will force a man to relinquish his career or to abandon his occupation); (4) grossly neglected cases, in which a pulpy condition of the joint has arisen. Bennett makes a vertical incision, converting it if necessary into an L-shaped incision. The transverse incision, including the division of the patella, is needless. It is not necessary extensively to expose the joint. The seat of the trouble is indicated by the local symptoms. The patient is kept in bed for a week previous to the operation, and massage without passive movement is used. The operation is never performed until all the fluid in the joint has disappeared; to operate with fluid in the joint is unjustifiable. The day after the operation, unless pain or some other conditions contraindicate, massage above and below the knee is commenced, the dressings being left undisturbed. Not later than the fourth day, gentle passive movement of the patella is begun, in order to prevent its becoming fixed. At the end of a week, passive movement of the knee is commenced, the splint being removed for a short time daily. The risk of these operations is comparatively slight. In view of the slight risk and the impossibility of making a certain diagnosis without opening the joint, it might reasonably be submitted that a more rational plan than reserving the operation for a last resource would be first to perform exploratory operation and then to proceed with the treatment indicated; but there are two main objections: we can not perform

operations with entire impunity, and even if we could, it is not justifiable to operate in cases in which there is a good chance of recovery without operation.

Edmund Owen,¹ lecturing on a case of internal derangement of the knee-joint, in which the symptoms pointed to displacement of the semilunar cartilage toward the central part of the joint, said that nothing short of a cutting operation would put the knee right. He opposes rushing to operation in such cases, for he thinks that the patient should be in bed the best part of a week before operating, during which time the man and the joint train themselves for the ordeal. During this period long lateral splints of gypsum are molded on to the limb, to be ready for application after the operation. The operation is undertaken after the synovial effusion disappears. A vertical incision is made a little behind the inner border of the patella. The synovial membrane is opened and the joint inspected. When this was done in the case which Owen showed to the class, it was at once seen that the anterior part of the internal semilunar cartilage was torn out of its place, and was lying between the articular surfaces of the inner femoral condyle and the tibial tuberosity. It was found necessary to remove this cartilage, and it was cut away from the internal lateral ligament and from the tibia. This case did very well.

W. J. Walsham² makes some remarks on the **operative treatment** of various **internal derangements of the knee-joint**. He classifies these derangements as follows: (1) Loose bodies, (2) detachment or displacement of the semilunar cartilages, (3) enlargement with nipping of hypertrophied synovial fringes, and (4) elongation of the ligamentum patellæ. All these conditions may be attended by similar symptoms: viz., effusion into the joint, a feeling of weakness of the joint, limitation in flexion and extension, pain (which is often sudden in onset, and which may be very violent during some motions), and at times a sensation of slipping, in or around the joint. There is usually a history of a fall, of a blow, or of a sprain or twist of the joint. The most obvious sign is the effusion, and the case is probably diagnosticated as one of synovitis; but it is synovitis and something more, and this something more must be made out. If a loose body is the cause of the trouble, the diagnosis is usually easy—it can be felt to slip about the joint by the surgeon, and also by the patient, and yet occasionally it is discovered with great difficulty. In one of Walsham's cases it was found by the x-rays; in another case it was not until the joint had been exposed by dividing the patella that the loose body was found in the intercondyloid notch, between the crucial ligaments. The diagnosis between a detached semilunar cartilage and a hypertrophied synovial fringe is often difficult; but there is rarely any locking of the joint from hypertrophy of a synovial fringe, although the disability may be as great in the latter condition as in the former, and it will be found on careful questioning that the pain occurs only when the joint is semiflexed, and then not unless the semiflexion is combined with some lateral twisting of the tibia and femur. The semi-

¹ Lancet, April 28, 1900.

² Brit. Med. Jour., July 29, 1899.

flexion separates the articular surfaces, and the twisting movement carries the hypertrophied synovial fringe between them, and it is nipped when the limb is again straightened. Elongation of the ligament of the patella is not common. The patient may fall to the ground in a sudden pain, the joint locking momentarily. This is owing to the patella, because of its elongated ligament, having momentarily slipped over the external condyle. Measurements show that the ligament is $\frac{1}{2}$ of an inch to an inch longer than that on the opposite limb, and when the patient sits with the knee flexed at a right angle, the patella rests on the front of the condyle, so that its anterior surface, instead of being directed forward and slightly upward, will be found to look directly upward. The author then discusses the preparation of the patient for operation, and insists that any synovial effusion shall be quite gotten rid of before the joint is opened; because, if this is not done, there will be considerable risk of septic trouble spreading into the interior of the joint, should any superficial stitch suppuration occur. After the operation is completed Walsham always sutures the synovial membrane and capsule with fine strands of kangaroo tendon, but silk may be used with safety. A continuous suture is used, and the serous surfaces should be placed in contact. After the operation the author orders absolute rest, the extremity being kept upon a posterior splint until the wound is healed, firm pressure being applied by a bandage over the joint to prevent oozing. He insists on early passive movements and massage. In speaking of the treatment of elongation of the ligament of the patella, he says that if we attempt to shorten the ligament by removing a portion and suturing the ends, the fibers will fray out when the sutures are tightened. It is better to cut off the tubercle of the tibia and transplant it further down the tibia, fixing it by an ivory peg. Walsham has treated 3 or 4 cases of elongation of the ligament in this manner.

H. Littlewood¹ lectured on some complications following **injuries about the elbow-joint**. A deformity which is not unusual is as follows: When the wrist is extended, the interphalangeal joints of the fingers and thumb are strongly flexed, so that the tips of the fingers touch the lower part of the palm, and they can not be straightened by any reasonable amount of force. As soon, however, as the wrist-joint is flexed to a right angle, the interphalangeal joints can be readily extended. When the case is first seen, it may be thought that the deformity is due to nerve injury—probably musculospiral injury; but this will not account for the deformity, although one or more of the nerves may be involved. The deformity appears to occur in children after some severe injury about the elbow-joint, and generally after a fracture which separates the lower epiphysis of the humerus. The cause of the deformity is primarily in the muscular portions of the flexor muscles of the forearm. The antecedent injury has been severe and the flexor muscles have been torn—it may be by the displacement of the forearm backward with the lower end of the humerus. The torn muscle is replaced by fibrous tissue, and this contracts and is

¹ Lancet, Feb. 3, 1900.

responsible for the deformity. A lump can always be felt in the flexor muscle in the upper third of the forearm, and the condition is like that which occurs in a sternomastoid which has been injured during birth. Splint pressure has nothing to do with the production of the deformity. These cases can be much benefited by operating and lengthening tendons.

W. Arbuthnot Lane¹ discusses **mechanical or traumatic arthritis**, and he uses this term to include all pathologic changes which are or were regarded as evidence of the presence of the disease known as osteoarthritis or rheumatoid arthritis. Fourteen years ago he pointed out

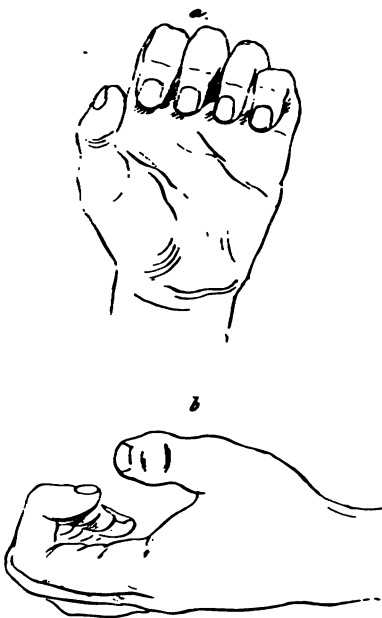


Fig. 43.—Complications following injury about the elbow-joint: *a, b*, Position assumed with wrist extended (H. Littlewood, in *Lancet*, Feb. 3, 1900).

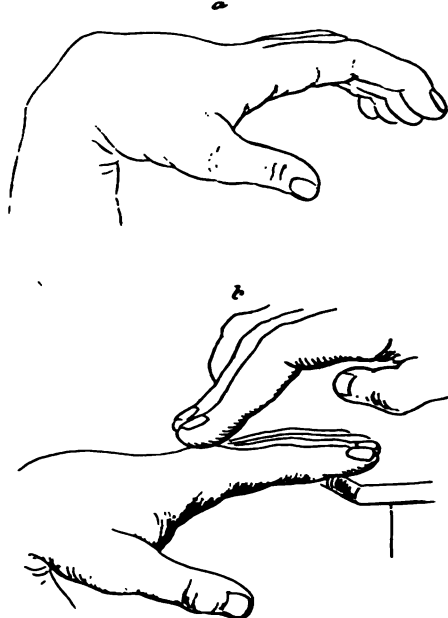


Fig. 44.—Complications following injury about the elbow-joint: *a*, Position assumed with wrist flexed; *b*, amount of forcible extension possible with wrist flexed (H. Littlewood, in *Lancet*, Feb. 3, 1900).

that the conditions which are said to be manifestations of osteoarthritis are really produced mechanically and in obedience to certain simple laws. He can not find in our museums specimens of rheumatoid arthritis which are not mechanical in origin. Exactly similar changes, produced in a precisely similar manner, occur in the skeletons of domestic and other animals. Of the pathology of true rheumatoid arthritis we know only enough to say that it resembles in no manner the pathologic conditions to which the same term is still almost universally applied. Owing to absence of familiarity with pressure changes, and consequent ignorance of the normal physiology of the skeleton, surgeons describe as the product of disease bony alterations which really result from

¹ Practitioner, May, 1900.

a physiology different from the usual, and which is perfectly characteristic of the anatomy of the individual in his mechanical relationship with his surroundings. Any deviation from the normal in the form of a bone or joint—such as a partial or complete ankylosis of an amphiarthrodial joint, the eburnation and limitation in the range of a freely movable joint, etc.—invariably suggest to their minds some antecedent inflammation, and the chief blame for this want of knowledge rests with the anatomists, who either ignore the consideration of the physiology of the skeleton, or describe it in the most unscientific manner possible, and usually incorrectly. The skeleton remains normal only as long as it performs a certain combination of movements of activity and assumes attitudes of rest. The individual bears a definite mechanical relationship to his surroundings, which varies in different races, and the average individual of each race has a normal anatomy of his own. The performance of the several physiologic functions in feeble children is imperfect; they habitually assume attitudes of rest in proportion as they perform their respiratory functions inadequately. These attitudes later become fixed, because the rate of bone formation varies inversely with the pressure. Thus is produced an alteration in the relation of the epiphysis to the body of the bone, and a change in the ends of the bone where it comes in contact with adjacent bone. The articular surfaces have an altered area because of the formation of bone upon their edges, and in movable joints this marginal osseous formation is covered by articular cartilage. As the patient passes middle age, the opposing surfaces of cartilage are removed at the points of greatest strain, and the layer of bone exposed is rendered dense and eburnated. Associated with this is progressive destruction of the opposing bone surfaces, with the formation of additional bone on their articular margins for the purpose of rendering the joints secure. If a vigorous subject habitually assumes the same attitude or sequence of attitudes of activity, the posture becomes fixed, and later aggravated, because of the partial or complete removal of the soft parts between the bones; and associated with this is formation of bone on the margins of the articular surfaces. Strain exerted on muscles and ligaments tends to convert muscle into tendon and ligament into bone. Lane describes many specimens to prove these contentions. He thus maintains that the changes produced by purely mechanical means are identical with those which are usually considered as due to rheumatoid arthritis, and that the so-called osteo-arthritic changes, which are often regarded as being the cause of a deformity, are really dependent upon an alteration in the function or in the physiology of the part. Cause has been confused with effect.

Lewis A. Stimson¹ describes a **method of reducing dislocations of the shoulder and the hip**. A hole 6 inches in diameter is made in the middle of a canvas cot 1½ feet from one end. The patient is laid upon the cot on his side, and the injured arm is passed through the hole in the canvas. The legs of the cot are placed on chairs and a sand-bag weighing 10 pounds is fastened to the wrist. In a few moments reduc-

¹ Med. Rec., Mar. 3, 1900.

tion of the dislocation takes place. For dislocation of the elbow the same method can be employed. In a dorsal dislocation of the hip the method is applied as follows: The patient is placed upon his stomach on a table, the thighs extending beyond the end of the table. The sound thigh is held horizontally by an assistant, in order to keep the pelvis from tilting. The injured thigh hangs vertically. The surgeon grasps the ankle, holds the leg in a horizontal position, and moves it gently from side to side. If the muscles do not quickly relax, a 10-pound sand-bag is laid upon the leg, just behind the knee, or pressure with the hand is made there. In four-fifths of the cases this method will succeed in effecting reduction.

Theodore A. McGraw¹ describes a new **method for reducing old dislocations of the lower jaw**. He had made a strong steel hook, the prong being short and bent in such a manner as to run parallel with the shaft and near it. The space between the prong and the shaft was just sufficient to allow the hook to pass over and grasp the jaw at the sigmoid fossa. In his case he determined to make incisions under each zygoma, separate the fibers of the masseters, pass the hook in front of the condyle on each side and over the bone at the sigmoid notch, and then use the hook to pull down and back and get the condyle into place. In carrying out this procedure he made a T-shaped incision below the right sigmoid arch, and he found that the hook could be readily passed through the fibers of the masseter muscle, it not being necessary to divide them. He then caught the hook over the bone in front of the condyle. Pieces of cork were placed between the molar teeth, as far back as possible; and an assistant pulled the chin forward and upward, while the surgeon pulled upon the hook. This combined traction was kept up for 15 minutes before the jaw began to yield; but although it became more movable, it could not be replaced. McGraw now made a straight and short cut below the left sigmoid and passed the hook in on that side. He then carried out a procedure similar to the one he had just conducted on the right side, and the jaw slipped into place. For 2 weeks it was kept bandaged and all motion was forbidden. The patient recovered most satisfactorily.

VENEREAL DISEASES.

In a discussion² on **the prevention and treatment of syphilis in the navy and army** at the meeting of the Brit. Med. Assoc., Aug. 1-4, 1899, E. E. Mahon concludes that good naval barracks, recreation grounds, advice to young sailors regarding cleanliness, and early reporting of suspicious symptoms, combined with encouragement to early marriage by offering pensions to seamen's widows, would tend to lessen the amount of venereal disease in the British navy. He also suggests that pensioners not suffering from the sequelæ of venereal diseases be given preference in civic employment. Major Dick reported statistics on the prevalence of venereal disease in the British army in India which showed

¹ Med. Rec., Oct. 7, 1899.

² Brit. Med. Jour., Oct. 21, 1899.

an increase of 15% in the last 15 years, the number invalided home from abroad for venereal disease having increased from 86 cases in 1880 to 804 cases in 1897. He agreed mainly with the previous speaker in his recommendations. C. R. Drysdale, in presenting his views, stated that medical advice given free to the poorer syphilitics in dispensaries and hospitals was a far better preventive than police supervision. Universal marriage, with restricted families, as in France, would lessen venereal disease and combine hygiene with economy; the low rate of venereal disease in the German army being due, according to Nordau, to marital relations being held with working women, both parties being true to each other. Major Lambkin believes that the prevention of venereal disease rests with legislative enactment. In discussing the treatment of syphilis he thinks that many, if not almost all, cases cease treatment after leaving the hospital, and suggests that subsequent visits, say, once a week, be made for as long a time as necessary for intramuscular injections; he has used hydrarg. 5j, lanolin pur. 5ij, ol. carbol. (1:20) 5iv, in 20,000 cases with only one accident: viz., the formation of an abscess.

The **rational treatment of syphilis** is the subject of a paper by A. H. Ward.¹ After a very thorough discussion of the theory of the disease, the author concludes: "Mercury should be used alone in primary and secondary syphilis, unless severe lesions are present. Treatment should be begun at the earliest possible moment. The drug should be given in a form easy to take and not irritating to the stomach. It should be carefully pushed to the toleration point indicated by slight touching of the healthy gums. The patient should maintain a constant weight. When the toleration point is reached, the mercury should be kept up to that point throughout the course; never higher, lest the patient be poisoned; never lower, lest sporing instead of destruction of the microbes should occur. The course should continue for 2 years, that being the period of natural cure or real latency. Iodids should not be used as routine treatment in the primary and secondary stages, because by removing the toxin the phagocytes will be no longer attracted to the microbes, and encapsulation and destruction will be hindered. Iodids in increasing doses with mercury should be used in the gummatous stage; later, a mild mercurial course is advisable. In intractable cases with chronic blood-poisoning and severe lesions a large quantity of water taken daily facilitates the excretion of the toxin, and, in the shape of Zittman's decoction, is undoubtedly very effectual. Finally, it is my conviction that the point of central importance in the treatment of syphilis is to push the mercury to the toleration point, and to keep it there throughout the case."

In an article on **syphilis in surgical practice** Arthur Dean Bevan² calls attention to the great number of cases presenting symptoms of various kinds which really depend on the syphilitic infection, and suggests that this disease should always be borne in mind. He says, *e. g.*, that an infection of the hand "which is not acute, which produces enlargement of the

¹ Brit. Med. Jour., Oct. 21, 1899.

² Jour. Am. Med. Assoc., Aug. 5, 1899.

axillary lymphatics, which persists for more than 10 days, which is locally limited, which is accompanied by a slight continued elevation of temperature, is suspicious of syphilis, no matter what the size, shape, or consistency of the sore may be." He thinks the fact that physicians more frequently than nurses acquire syphilis of the fingers is due to the observance of prophylactic rules by the nurse. The author cites a case of death resulting from primary syphilitic intoxication before the appearance of secondary symptoms, and states that syphilitic fever may be mistaken for typhoid. Among the forms of syphilis causing unusual symptoms he reports a case of spontaneous fracture of the humerus from a gumma, and cases of joint syphilis which were mistaken for tuberculosis and gonorrheal rheumatism. The melting away of granulations during the administration of iodid of potash is not proof that they are syphilitic, as actinomycosis will respond in the same way.

At the meeting of the Brit. Med. Assoc., Aug. 1-4, 1899, Walter G. Spencer¹ reports 2 cases of **fatal venereal phagedena**. In the first case the skin of the penis and scrotum, as well as the anterior wall of the rectum, were gangrenous, and the skin over the pubes was edematous and the edema extended over both iliac crests. The treatment consisted in cutting away the sloughs, swabbing the wound with pure carbolic acid, and subsequent dressing with strong permanganate of potash solution. A fecal fistula followed the rectal slough. The patient died one week later of bronchopneumonia. In the second case a double pyosalpinx was exposed on abdominal section. The stumps were swabbed with carbolic acid after the operation and the pelvis was packed with iodoform gauze. On the ninth day the wound was opened and the inner surface was found to be phagedenic. Four days later feces escaped, and death ensued in 2 days.

It is asserted by Desnos and Guillon² that **picric acid in the treatment of chronic urethritis** is almost a specific. The drug is used in a solution in the proportion of 1 : 200 or 1 : 100, and is introduced by a syringe and hard catheter, the latter being passed as far as the compressor urethra muscle, the solution being forced in gently until it flows from the meatus. The quantity used is from 20 to 80 drops. In treating the posterior urethra the catheter is passed through the compressor muscle and the fluid is allowed to flow into the bladder, the latter having been first emptied. The authors state that it is impossible to produce toxic symptoms when this amount is injected into the urethra, although in cases of extensive burns poisoning has been caused with picric acid. Stains of clothing, etc., are removed with dilute ammonia solution. Twenty-nine cases of urethritis which had proved intractable to other treatment are reported, 12 being tubercular and 17 due to other germs. Of the tubercular cases, 2 were cured, 7 benefited, 2 made worse, and 1 showed no effect. Of the 17 cases of simple chronic urethritis, 13 were cured, 2 benefited, and 2 showed no improvement; of the last, one was cured by the performance of urethrotomy and one by the administration of protargol.

¹ Brit. Med. Jour., Oct. 21, 1899.

² Jour. de méd. de Par., No. 41, 1899.

In an article on the **treatment of acute gonorrhea** P. Albarran¹ recommends distending the urethra with air and injecting 2 cc. of pure ichthyol and 3 cc. of air with a 10-cc. syringe. The author asserts that the failure of the usual methods is due to the fact that the germs lurk in the folds and crevices of the urethral mucous membrane, and are thus sheltered from the irrigating fluids. The syringe should be passed through a perforated cone, which prevents the air from escaping, the cone being held against the meatus for from 1 to 3 minutes, while the urethra is lightly massaged.

In a paper on the **abortive treatment of gonorrhea**, read before the French Congress of Urology, Motz reports 25 cases with satisfactory results. His method consists in, first, lavage of the anterior portion of the urethra with a 1:500 potassium permanganate solution (section by section). Twelve hours later he rinses out the anterior urethra with a 1:1000 solution, and the posterior urethra with a 1:2000 solution. If the secretion diminishes and becomes more fluid, the lavage of the anterior portion is continued with the 1:2000 solution, followed 12 hours later by lavage of both portions with the same solution. If the secretion does not decrease, he makes a third and a fourth lavage with the 1:1000 strength. Nogués confirmed the efficacy of this method in the preinflammatory stage.

The **use of dermatol in gonorrhea** is discussed and a report is given of 19 cases of acute and 11 of chronic gonorrhea treated with dermatol by Dokoutschaieff.² In the acute variety the urethra is first washed out with a tepid 2% permanganate of potash solution, and the following emulsion is instilled, first in the posterior and then in the anterior part: *R.* Dermatol, 2 gm.; powd. gum-arabic, 2 gm.; distilled water, 25 gm. The instillations are repeated every 2 hours, being allowed to remain for 5 minutes and then to escape in drops, the patient being forbidden to urinate while the emulsion is escaping. In anterior urethritis the instillations are continued for 34 days, when posterior applications are begun. In treating chronic cases the urethra is first washed out, and then a bougie covered with *R.* Dermatol, 0.60 cgm.; lanolin, 10 gm.; white wax, 2 gm., is passed. The bougie is passed to the neck of the bladder, and the urethra is massaged, at first lightly, and then for a longer time, not longer, however, than 20 minutes nor repeated oftener than twice daily. Of the 19 acute cases, 4 became chronic; and of the 11 chronic cases, 3 were unimproved. Epididymitis occurred in 3 of the acute cases, the time of cure in the acute cases being from 8 to 46 days; of the chronic cases, 19 to 43 days.

In a recent clinical lecture at the Hôpital St. Louis, Fournier³ stated that the **indications for administering balsamics in gonorrhea** are set forth in the following rules: (1) The use of balsamics is always attended with failure as an abortifacient. (2) Balsamics are equally ineffectual in gleet; 3.80% of cases of gleet are caused by the improper use of these agents. (4) They should not be begun before the end of

¹ *Revista de med. y de Cir.*, Aug. 10, 1899.

² *Medécinskoe Obosrenie*, No. 2, 1900.

³ *Jour. Am. Med. Assoc.*, Dec. 23, 1899.

the fourth week, or at the end of the inflammatory period. (5) They should be given in large doses (a mixture of ʒiiss of cubebs and gr. xlvij of copaiba to get good results). These doses should be continued for 10 or 12 days, and must then be gradually diminished. (6) Treatment should be taken 3 times a day, and the amount of fluids taken should be restricted. (7) Nothing is gained by changing the variety; stick to the one chosen, and if at the end of 10 days the discharge is not almost stopped, discontinue for 8 or 10 days, and then resume.

Mercuriol, which is an organic compound of 10% of mercury with nuclein, is discussed by Fraley¹ in the **treatment of acute gonorrhea**. Mercuriol is a light, brownish-white powder, insoluble in alcohol, but soluble in water. Fraley uses it in 1% solution, although it may be employed in 0.25% to 2%. Injections are ordered every 2 hours, the injection being retained for 2 minutes and the patient reporting every day for microscopic examination of the discharge. In a series of 14 cases, 6 were cured in less than 4 weeks, 3 were nearly cured in 3 weeks, 3 were improved in 16 days, and 2 were not improved, although temporarily benefited. Simple anterior urethritis responded most readily, the poorer results in posterior urethritis being due, in the author's opinion, to the use of weak solutions. The writer thinks potassium permanganate is better for irrigation, but mercuriol is superior for injection. It is an unirritating remedy, producing cures in less than 4 weeks, and, when this is compared to the usual 6 weeks, the drug is evidently worthy of trial.

Two cases of **acute diffuse gonococcus peritonitis** are reported by Cushing.² He concludes: (1) The gonococcus may cause pathologic conditions other than gonorrhea; (2) in some animals it has been shown experimentally that the gonococcus can set up acute alterations in the peritoneum similar to those met with in human peritonitis, but differing in the tendency to spontaneous healing; (3) peritonitis in women, accompanying gonorrhea, hitherto has not been proved to be due to the gonococcus alone, or principally, but was regarded as mixed infection or chemical inflammation; (4) these cases for the first time show conclusively the occasional occurrence of a diffuse general inflammation of the abdominal cavity, due to the gonococcus; (5) extension of the gonorrheal infection has been shown to occur in the puerperal state, and is now shown to occur also during menstruation; (6) the gonorrheal infection usually remains localized, surgical intervention being rarely required during the acute stage; (7) the cases reported must be rare, due to especially virulent organisms or to very receptive local conditions; (8) the serous coats of the pericardium, endocardium, and peritoneum are all subject to the infection, infection of the latter occurring more frequently in women, although seldom requiring operative interference in the acute stage.

P. E. Launois³ described a case of rare complications of gonorrhea at a meeting of the Société Médicale des Hôpitaux of Paris,

¹ Therap. Gaz., Nov. 15, 1899.

² Johns Hopkins Hosp. Bull., vol. x, No. 98.

³ Lancet, Sept. 30, 1899.

July, 1899. The patient, a man of 40, when examined showed marked emaciation, was incapable of making any movement, and complained of pain everywhere. Most of the joints were deformed, there was great muscular atrophy, and the head appeared as if rigidly fixed on the shoulders. The great toe was the seat of enormous horn-like masses of proliferated epithelium. There was a history of 5 attacks of gonorrhea, the first at the age of 20; and each attack was accompanied by polyarthritides, followed by deformity. Similar cases are reported by Vidal and others. Launois suggests that toxic action of the gonococcus on the nervous system caused the condition. [It has been pointed out by Leleneff that the nervous system may suffer severely in gonorrhea. He shows that there may be sensory nerve changes (pain in skin, joints, muscles, nerves, internal organs, etc., anesthesia, or hyperesthesia), vasomotor nerve changes, changes in secretory and trophic nerves, and motor nerve changes (paresis and paralysis). He also points out that the central nervous system may suffer in gonorrhea (neurasthenia, hemiplegia, and psychoses). See *Vratch*, No. 4, 1900.]

Ferd. C. Valentine¹ writes on **acute gonorrhea treated by mercuriol irrigations**. The treatment consists of an anterior irrigation with 5% mercuriol. The next morning an irrigation of a strength of 2.5% is given, and each evening and morning following an irrigation of 1% mercuriol is used. Microscopic examination showed absence of gonococci on the second day, and the discharge was reduced to a small drop after the fifth irrigation. There was a burning sensation with frequent and imperious desire to micturate after each irrigation during 3 days, and this condition was present in slight degree after several subsequent treatments. The author has ordered stronger solutions than 5%, but in each instance the pain has been aggravated, and he states that the results in other cases have not been so satisfactory as in the one reported. In 5 cases of sub-acute gonorrhea in which the injection of a 5% solution of mercuriol accidentally entered the bladder, in 12 hours the discharge became copious, with tumefaction of the penis. In comparing gonococcicidal drugs with permanganate of potassium Valentine's results are entirely in favor of the latter. In discussing the above paper Ramon Guiteras said that the results at the Post-Graduate Hospital from the use of mercuriol were very satisfactory, although the solution used was milder, being of a strength of 2% in all cases of urethritis which are not very acute, and in no case were there any untoward symptoms. He spoke warningly of the substitution of the bichlorid of mercury for mercuriol by unscrupulous pharmacists.

Finger,² of Vienna, in some recent lectures on **the modern treatment of gonorrhea**, stated that it was the rule not long ago never to use injections during the acute stage, but at present local applications are begun at once, although the average duration of a case is as great as under the old methods of treatment. The advance which has been made is in the prevention of infection of the posterior urethra. Finger states that 70% to 80% of cases of gonorrhea which are allowed to run the ordi-

¹ *Phila. Med. Jour.*, May 19, 1900.

² *Wien. klin. Woch.*, Heft 1, 1900.

nary course have involvement of the posterior urethra. When protargol is used, 40 % show posterior involvement, but only 27 % show it when largin is administered. The author uses internally, from the beginning of the attack, sandalwood oil, or a substance prepared from it called gonorrhol, thus differing from Fournier, who never uses balsamics before the end of the fourth week.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

Mayo Collier¹ records an interesting case of **rupture of the brachial plexus**. The man was picked up unconscious by the side of the road and taken to the hospital. It was subsequently found that he was subject to epileptic fits. He remained unconscious for several days, but gradually his consciousness was regained. After restoration to consciousness it was found that the right upper extremity was totally paralyzed. The optic discs and the cranial nerves were normal; there were no motor or sensory disturbances of the face, trunk, or limbs; there was no abnormality which could be detected at the root of the neck on either side, but passive abduction of the right shoulder was painful. The pupils were unequal, the right being somewhat smaller than the left; they contracted normally to light during convergence; both pupils dilated when shaded, but the dilation was more marked on the left side than on the right. The ciliospinal reflex was normal on the left side, but absent on the right. There was absolute anesthesia to touch, pain, and temperature over most of the right upper extremity. There was marked muscular atrophy of the arm and forearm, and the reactions of degeneration were demonstrated. It was evident that the nerves going to the rhomboids and the serratus magnus escaped, but that all the other muscles supplied by the brachial plexus were totally paralyzed. The lesion must have affected the upper trunk of the plexus below the point where the nerve to the rhomboids is given off. There were some interesting diagnostic points in this case: The patient was admitted in an unconscious state, with a bruise on the left side of the head and with paralysis of the right arm. This combination suggested paralysis due to cerebral injury, but the profound anesthesia of the limb was against such a view; and, moreover, the paralysis was of the flaccid type, unlike the rigidity of a cerebral palsy, and subsequent examination showed marked muscular atrophy and the reaction of degeneration. Such a combination of anesthesia, motor paralysis, and muscular atrophy indicated that there was an extensive lesion of the peripheral nerves supplying the limb. Another point of interest is that about 8 weeks after the accident the patient had an epileptic fit in which all the limbs were convulsed with the exception of the paralyzed arm. This is an interesting contrast to what would have happened if the paralysis had been due to injury in the neighborhood of the cortical motor center; for in the latter case convulsion would have affected the paralyzed arm, and might even have started in it.

¹ Lancet, Mar. 10, 1900.

Robert Kennedy¹ elaborately discusses the **regeneration of nerves**, gives a review of the chief papers which have been written on the subject, and reports 4 cases of his own in which secondary suture of the nerves was performed. In the first case he sutured the median and ulnar nerves about 6 months after they had been divided in the middle of the forearm. At the time of operation there was complete loss of sensation and motor power in the area controlled by these nerves in the hand. Sensation began to return 3 days after the operation. On the nineteenth day after the operation touch could be localized correctly in all parts of the fingers, and by the end of the first month sensation had become practically perfect. There was some improvement in motion, but it took place slowly and was incomplete. The second case was suture of the median nerve 3 months after it had been completely divided above the wrist. Sensation began to return 2 days after the operation. Motor power also came back quickly, and at the end of a year the patient was almost completely well. In the third case the median, musculospiral, and ulnar nerves were included in a cicatrix in the neighborhood of a fracture at the elbow-joint. Portions from the median and musculospiral were excised, the nerves being sutured, 2 months after the injury. Sensation began to return on the fourth day, but came back quite slowly. The case was watched for 6 weeks, and at this time there had been no improvement in motion, but sensation had returned in the fingers. In the fourth case the ulnar nerve was sutured a year and a half after division. Five days after the operation sensation began to return, and 6 weeks after the operation sensation was almost normal, although motor power had not improved. The author concludes that the early return of sensation indicates that the conducting power of the nerve has been restored, and that this early return of sensation depends upon reunion of the nerve. The fact that motor power comes back slowly and imperfectly is due to the atrophy or destruction of the muscles, and the restitution of such a muscle is slow or even impossible. The microscopic examination of the portions of the nerves removed affords the following deductions: There was no evidence of ascending degeneration; the old axis-cylinder and myelin sheath were destroyed in the peripheral segment and in the ultimate portion of the central segment; young nerve-fibers were developing in the peripheral segment, as well as in the end of the central segment—and that when there was no connection between the two ends; these young nerve-fibers arose within the old sheath of Schwann, from the protoplasm and nucleus of the interannular segment; so long as conductivity of the nerve was not reestablished, the development of new nerve-fibers proceeded only to a certain stage; a cicatricial segment uniting the ends of a divided nerve might be permeated by young fibers from end to end without function having been reestablished, if the mass of cicatricial tissue was sufficient by its pressure to prevent the passage of impulses.

Victor Horsley² delivered an instructive lecture on **injuries to peripheral nerves**. He says that he is certain that the diagnosis

¹ Lancet, July 22, 1899.

² Practitioner, Aug., 1899.

between functional and organic diseases can always be made if we bear in mind what the actual structures are with which we have to deal. A mixed nerve—a peripheral nerve, as it is called—contains motor fibers, sensory fibers, and vasomotor fibers, and, in addition, fibers which exert a trophic influence upon the structures to which the nerve is distributed—which fibers may be motor. If you have a simple, nonirritating condition of a peripheral nerve, the parts beyond atrophy; but they do no more. It is shown that trophic changes after section of the fifth nerve are not present if the section of the nerve was absolutely aseptic and there was nothing irritative about the peripheral end of the divided nerve. Of course, if we find that there is glossy skin, or if blebs appear on the balls of the fingers, we know at once that the injury to the peripheral nerve is not a simple injury, but is an irritative lesion. We see only trophic changes, apart from simple atrophy, when we have an irritative lesion of a mixed nerve. Horsley then discusses some general considerations as to the functions of nerves and recuperation. Ever since Hüter pointed out that under some circumstances we could remove $1\frac{3}{4}$ inches of a peripheral nerve and have regeneration and reunion follow, attention has been directed to the marvelous recuperative powers of divided nerves. When recuperation takes place, it occurs by an outgrowth from the axis-cylinder of the divided nerve, which is in relation with the upper end of the neuron; and this outgrowth is usually multiple, consisting of two or three juvenile axis-cylinders. This outgrowth leads to reunion of a divided nerve. What happens in a nerve which is crushed or completely paralyzed and then gradually recovers? Exactly the same changes take place as when the nerve is cut. The first practical question for the surgeon is, Over what distance will the nerve become reunited? Horsley has never seen $1\frac{3}{4}$ inches bridged over, but he has seen $1\frac{1}{4}$ inches. A cicatrix forms the most complete obstruction to such a bridging; a cicatrix of only $\frac{1}{4}$ of an inch may be sufficient to prevent any reunion of the nerve. How long must one wait for regeneration? Operations are sometimes undertaken too hastily. In the case of a divided nerve when the original wound has healed by first intention, we should give it a fairly prolonged chance. Horsley cites the case of a divided ulnar nerve in which after 6 months there was marked restoration of function, and he therefore advises that the question of operation should be postponed for 18 months. He then investigates the different sorts of injury to which nerves may be subjected; first considering cuts which divide the trunk of a nerve or nerves, and next considering contusions, and also those common accidents in which a nerve is compressed (for instance, those cases of fracture of the lower end of the humerus in which the musculospinal nerve is caught in callus). If a nerve is caught in callus, it is necessary to operate in order to relieve the nerve from the injurious pressure. Stretching of the nerve is next considered. This is an accident which can occur only under particular circumstances and in certain parts of the body. It is impossible to stretch the sciatic nerve of an infant; but in the adult, if the knee is kept straight and the hip is flexed to a right angle, the sciatic becomes stretched. This is a rare

accident, however. There is one part of the body in which stretching of a nerve is not uncommon, and that is the posterior triangle of the neck. It occurs when the head is forced violently in one direction and the shoulder in the opposite direction; for instance, when a person is thrown out of a wagon. The stretching force is exerted along the line of the fifth cervical nerve, the first dorsal nerve at the lower part of the plexus escaping injury. The fifth cervical nerve would be stretched, but the first dorsal nerve would be slackened. It is the fifth cervical nerve, and to a less extent the sixth, which suffers, and the paralysis is limited to the preaxial border of the limb and to Erb's group of muscles; that is to say, the deltoid, the biceps, and the supinator longus. Extravasation is produced in the injured nerves, and there may also be hemorrhage into the adjacent nerve-roots. If there is, the next group of muscles may become affected: viz., the extensors of the wrist and the extensors of the fingers. The anesthesia is, as a rule, very slight, and the nerve-stretching produces great motor paralysis and little sensory paralysis. When motor paralysis results from injury to the motor fibers of the nerves, careful examination will enable the surgeon accurately to locate the seat of injury. The same is true of sensory paralysis. There are two important points to bear in mind with regard to sensory paralysis: In the first place, there is little objective disturbance of sensation,—*i. e.*, very little affection of sensation of the limb,—but there is a great deal of pain. Pain is very important to the patient, but it is useless as a guide to the localization of the seat of injury or the amount of injury. The reason of this is that the sheath of every mixed nerve is richly supplied with sensory nerves and sensory nerve-endings, and these *nervi nervorum* give rise to pain after being stretched. In addition, the sensory fibers which supply the peripheral parts of the limb have been injured and irritated, and hence cause subjective sensations of pain. Therefore, after any of these accidents the chief sensory disturbance is not anesthesia, but pain, unless there has been complete division or severe contusion. It is known that when we have severe injury of the spinal cord, there is vasomotor paralysis; and vasomotor paralysis is also seen after injury of the peripheral nerves. After severe laceration of a nerve, vasomotor paralysis is often one of the chief symptoms. The evidence of vasomotor paralysis is twofold: There is hyperemia, occurring in patches which correspond to the most damaged fibers, and there is also swelling. This swelling is of an edematous nature, and the swelling and edema may amount to the condition which is known as angioneurotic edema. It is almost always accompanied by severe pain, just as is the ordinary angioneurotic condition. When a careful operation has been performed and union obtained by first intention, the first objective phenomena to disappear are the trophic symptoms. The immediate effects of suture are often very remarkable. In a case of Horsley's, suture of the ulnar nerve was followed in 24 hours by a return of sensation in the little finger, which sensation gradually diminished in the next few days and then disappeared, returning some weeks later and developing into permanent restoration. This temporary prelim-

inary return has been frequently observed. It amounts to this: If we cut the ends of a nerve and bring the freshly divided ends into union, we have brought into contact two excitable masses of nerve protoplasm, just as it has been shown that if we fix together two freshly divided pieces of muscle and excite one piece, the second piece will also contract by the transmission of the electric energy accompanying the contraction of the first piece. For a few days after suture the excitability of the nerve protoplasm remains active, and then it usually gradually disappears, although in some cases it does not disappear. There is almost always an interval before the true recovery sets in. Horsley then discusses the methods of suturing nerves and the mode of freeing nerves from callus and scar tissue, the prognosis of these cases, and the subject of malin-gering and hysteria.

Rudolph Matas¹ reports a remarkable case of large **perineural fibroma** involving the entire sheath of the sciatic nerve and the deep femoropopliteal fascia. He extirpated the tumor and the popliteal vessels, leaving the uninjured sciatic nerve in place; and the patient recovered, with the loss of the toes and of the heel-covering from sloughing.

Rochet² makes a report of cases in which he removed the perineal branch of the internal pudic nerve for the relief of **painful urethrocystitis**. The internal pudic nerve was exposed as it passes from the small sacrosciatic notch, and the perineal branch was found and removed. The patients were relieved by the operation.

Albert B. Strong³ advocates the **bloodless method of stretching the sciatic nerve for sciatica**. The patient is placed recumbent with the legs extended. The leg must be kept straight with the thigh, and the whole limb is slowly brought upward to a right angle with the body. This is accomplished so gradually that it requires 15 minutes to perform, and it produces a considerable amount of pain and numbness. The limb is slowly laid down again, rested a few minutes, and then the same movement is repeated. In 3 or 4 days this maneuver may again be gone through with; and in very chronic cases the procedure may be carried out every 3 or 4 days for a number of months. In Strong's hands this method has been successful. [If stretching is advisable, it seems to us preferable to make an incision, exposing the nerve, and to stretch it and it alone, applying carefully a definitely ascertained and measured force. The plan advocated by Strong is uncertain, haphazard, stretches other structures, may do harm, and may not stretch the nerve sufficiently.]

H. W. Page⁴ writes on **Volkmann's ischemic paralysis**. He reports the case of a boy $4\frac{1}{2}$ years of age who had suffered from a fracture of the humerus in the neighborhood of the elbow. The arm had been dressed with anterior and posterior splints and in a position of semiflexion. A superficial slough had formed below the bend of the elbow, at a point where the angle of the anterior splint pressed. After

¹ Med. News, Dec. 9, 1899.

² Boston M. and S. Jour., Jan. 18, 1900.

³ Chicago Med. Recorder, Nov., 1899.

⁴ Chicago Med. Recorder, Nov. 1899.

⁴ Lancet, Jan. 13, 1900.

the tissue sloughed away, the wound healed by granulation. Marked contraction of the fingers occurred. The contraction in such a case results from the prolonged immobilization of the forearm by any apparatus which interferes with free circulation through the muscles and nerves. The proper treatment of such a case is tendon lengthening.

W. W. Keen and William G. Spiller¹ write on **peripheral resection of the fifth nerve** and report 3 cases, with microscopic examination of the portions of the nerves removed; they also report on the later condition of the patients. The relief from these peripheral operations is rarely, if ever, permanent; but it is so great that patients do not hesitate to undergo a second operation, because of the relief from suffering which the first gave them. In spite of the fact that the relief is only transitory, it is wise to perform these peripheral operations—at least until the mortality following the Gasserian operation has been materially lessened. Peripheral operations should be done early, before the disease has had time to invade the ganglion. Very early operations might cure permanently. The nerve is sometimes reproduced with amazing completeness. In 2 cases, in each of which Keen removed the inferior dental nerve, the nerve was reproduced, as he discovered on reoperating—on one case after 3 years, and on the other after 6 years. He found the reproduction of the bone in the jaw so perfect that if he had not done the first operation himself, he would have doubted whether any had been performed. In both the nerve was even larger than that which had been found at the first operation. One of these patients has had slight recurrences; the other had quite a severe return of pain. In nearly every case which Keen has seen the teeth have been extracted, and there was not the slightest good result from this utterly needless sacrifice. Spiller's report on the peripheral nerves removed shows degeneration of the medullary sheaths in the form of minute balls which were stained black by osmic acid.

Garré² reports a case of neuralgia in which he removed the third division of the fifth nerve at the base of the skull. The pain recurred, and he resected the Gasserian ganglion; but at the end of the third year the patient again suffered from pain in the course of the second and third divisions of the fifth nerve, and operation showed that the **nerve-trunks** which had been removed at the first operation were **regenerated**, in spite of the fact that the Gasserian ganglion had been removed.

Harvey Cushing³ describes a **method of total extirpation of the Gasserian ganglion** for trigeminal neuralgia by a route through the temporal fossa and beneath the middle meningeal artery. He says that in the Hartley-Krause operation many difficulties arise, chiefly from hemorrhage. The osteoplastic flap in the temporal region includes the sulcus arteriosus in the anterior inferior angle of the parietal bone, which lodges the middle meningeal artery, and this vessel is commonly lacerated, an accident which occasions delay before the real operative site is reached. When the ganglion is approached, the operator is so far from

¹ Jour. Am. Med. Assoc., April 28, 1900.

² Rev. de chir., Oct., 1899.

³ Jour. Am. Med. Assoc., April 28, 1900.

the cave of Meckel, in which the ganglion lies, that the brain and underlying dura must be elevated to a considerable degree, and this elevation is incompatible with the preservation of the artery at its lower fixed point: viz., at the foramen spinosum. Hence Krause finds it essential to make a preliminary double ligation of this vessel after its emergence from the foramen. This is a difficult procedure. It is often unsuccessful, and hemorrhage from the meningeal is an unpleasant thing to deal with. The excessive degree of retraction of the brain which is necessary may lead to unfortunate consequences. On one occasion, in a left-sided case aphasia arose, and in most of the earlier operations by this method only the outer portion of the ganglion was removed. Had it been thought necessary on all occasions to expose and liberate the sensory root proximal to the ganglion, the employment of the high temporal route would have been found frequently impossible. Even in the method used by Cushing, in which there is but slight elevation of the brain, there has been invariably associated retardation of the pulse. Cushing proposes the direct infra-arterial method: The trephine opening through the temporal fossa is sufficiently low to allow of extradural manipulation being conducted underneath the arch made by the middle meningeal artery. This artery is retracted with the dura, but remains uninjured at its two fixed points: viz., the foramen spinosum of the temporal bone and the sulcus arteriosus of the parietal bone. Under this arch, with but slight elevation of the temporal lobe, the entire ganglion and its sensory root may be exposed, and this method gives the maximum of exposure with the minimum of cerebral compression and injury of blood-vessels. The operation, therefore, differs only in detail from the Hartley-Krause method. The following is a description of the operation with discussion of the various steps:

“1. *Formation of Muscle-flap and Exposure of the Temporal Fossa.*—A horseshoe-shaped skin incision is made in the temporal region, its base about 4 cm. in breadth, corresponding to the zygomatic arch, and its convexity reaching about 5 cm. above it, but slightly higher than the level of the pinna of the ear. The incision, therefore, needs to be much lower and may be considerably smaller than that for the Wagner osteoplastic procedure as adopted by Hartley and Krause. This skin-flap is turned downward, some branches of the temporal artery being divided in the process, until the underlying temporal fascia is exposed well on to its attachments to the zygomatic arch and the posterior or temporal border of the malar bone. An incision is then made through the temporal fascia concentric with and just inside of the skin incision, and at the base of the skin-flap it is carried along the middle of the outer surface of the zygomatic arch through the periosteum down to the bone. The periosteum is then elevated from the bony arch, leaving the masseteric attachment at its lower edge uninjured, and the zygomatic processes of the malar and temporal bones are divided with heavy forceps, as in the resection of a rib. An incision concentric with the skin incision is then carried down through the temporal muscle, and the muscle is scraped away from the bony wall of the temporal fossa, to

which it has no attachment in this situation, and retracted downward together with the resected portion of the zygoma and into the space which this bony arch formerly occupied. In this way the lower portion of the temporal fossa of the skull, as far down as the attachment of the external pterygoid muscle below the infratemporal crest, is well exposed.

"Discussion of Step.—The one deformity consequent on the operative method via the temporal route follows upon the incision through the temporal fascia: namely, the division of the branches of the facial nerve which supply the occipitofrontalis muscle. As a result, there is a postoperative inability to elevate the eyebrow on the affected side. This paralysis, however, is not apparent during expressional rest except in old individuals, in whom there may be some resultant smoothing out of the cutaneous wrinkles on that side. I have found that it is necessary temporarily to resect the zygoma in order satisfactorily to retract the temporal muscle. A downward displacement of the bone, of only a centimeter or two, is all that is required to make room for the muscle, which otherwise would arch up over the zygoma and prevent proper exposure of the lowest portion of the fossa temporalis. It is easier to preserve than to detach the bony fragment, on account of the firm attachment of the masseter. This is not a necessary detail, however, and perhaps it would be advantageous to remove it. A new zygoma in one of my cases has reformed after excision; and possibly in this case there is less postoperative deformity, since the atrophy of the temporal and masseter muscles shows less plainly than in the other cases, in which the arch of the replaced zygoma seems unduly prominent on account of the sunken fosse above and below it.

"2. Exposure and Elevation of Dura as Far as the Ganglionic Sheath.—With a mallet and a gouge a small trephine opening is made through the most prominent portion of the exposed great wing of the sphenoid, and with rongeur forceps this opening is enlarged to a diameter of about 3 cm., its lower margin being carried well down and possibly including the ridge between the temporal and zygomatic fossae—the crista infratemporalis. The uninjured middle meningeal artery runs on the dura thus exposed, across the opening in the bone as the diameter of its circle. The dura, with this vessel, may then be easily lifted, almost bloodlessly, from the base of the middle fossa until the first point of firm dural attachment at the foramen ovale is reached.

"Discussion of Step.—It has seemed unnecessary to the writer to attempt to make an osteoplastic flap, even were it possible to deal with it in this deep situation, for the reason that the opening to be made through the skull is so small and after-closure of the wound so well protected. It is possible, indeed, that new bone is subsequently formed to cover the defect, since the slight pulsation of the flap which is apparent for some time after the operation ultimately disappears. It is well to make the first opening in the bone at the upper part of the proposed area of removal, since it is easier to bite away the bone with the rongeur forceps in a downward direction; and, furthermore, because as the base is approached the sphenoidal wing becomes much thicker,—

occasionally 0.85 mm.,—and consequently is less easily penetrated with the mallet and chisel. Care must be taken in the use of the gouge, since the bone is at times exceedingly thin and one or two strokes with the mallet will carry the instrument through. Additional care is necessary, for the middle meningeal artery is usually exposed by the first small opening in the skull. It ordinarily runs beneath the most prominent part of the wing of the sphenoid and squamous portions of the temporal bones, which have been uncovered, and this is naturally the point selected for the primary opening. It is important, in view of preservation of the ganglion and avoidance of possible injury to the deeper vessels, that no fragments of bone be allowed to fall down between the skull and dura, since at a later stage of the operation, when it is necessary firmly to press pledgets of gauze against the ganglion to check the bleeding from its underlying arterioles, these spiculæ may, as occurred in one of my cases, be firmly driven into its substance. By a similar accident one of them might be driven into the sinus. Occasionally the prominence, which has previously been described as present on the floor of the fossæ, may be of sufficient size to interfere later with a satisfactory approach to the foramen ovale. This may then be chiseled off or the floor of the fossa rongeured away so as to include it.

“3. *Elevation of Dura with Meningeal Artery and Exposure of Upper Surface of Ganglion.*—By careful blunt dissection with the proper instrument, and by working at the dural attachment about the foramen rotundum and in the line between this point and the foramen ovale, where it is again firmly attached, the edge of the dural envelope which incloses the ganglion and its peripheral intracranial branches may be split, and by careful elevation the entire upper surface of the stellate structure may be exposed well back on to the sensory root, the ganglion being left in its bed still adherent to the underlying portion of the envelope.

“*Discussion of Step.*—This procedure should be attended with but little hemorrhage, since the blood supply, as heretofore stated, is from below. It is of importance that *the ganglion should not be elevated in this maneuver*, since it is advisable to postpone what degree of hemorrhage is unavoidable as long as possible, and furthermore because it is much easier to elevate the overlying dural sheath from the ganglion if its attachments to the unyielding base have remained uninjured. This entire procedure is carried on under the arch made by elevating the temporal lobe and its overlying dura and artery. A simple spatula of about 2½ cm. in width, which can be bent at the proper angle, makes the most satisfactory retractor for these structures.

“4. *Liberation and Extraction of Ganglion and Its Branches.*—After the exposure of the upper surface of the ganglion and before division of any of the peripheral branches, these three nerves, with the ganglion and trigeminal root, should be liberated from the attachments to the base. This is readily accomplished by working with the blunt dissector in the crotches between the second and third divisions and also along each side of the nerves. After the ganglion and the second and third divisions have

been liberated and can be lifted up by the dissector, it is necessary to free the superior and internal edge of the trigeminal root and first division. It is well to conduct these manipulations as near as possible to the sensory root, since that is the safest point, and one at which there is less likelihood of injuring the cavernous sinus and sixth nerve. The ganglionic structure may thus be completely liberated without division or laceration of a single branch. With a firmly locking pair of hemostatic forceps—I have used Kocher's—the structure may then be grasped just back of the site of the true ganglion on the trigeminal root; the three peripheral divisions are in turn held up with a blunt nerve hook and divided with scissors close to their foramina; the sensory root is then evulsed by means of the previously attached pair of forceps.

“Discussion of Step.”—This part of the operation is the most difficult and the one in which preliminary training on the cadaver is found most essential. The degree of force necessary to separate the ganglion without injuring it—for if lacerated or torn away from its roots its extraction becomes most uncertain—can be learned only by experience, which should hardly be gained at the expense of the patient. The operator's reflexes should have become familiarized with the crackling sensations imparted to the hand on separating the adhesions at one point or another during the process of liberation. The bleeding which follows the maneuver, especially about the foramen ovale, is sometimes very annoying, but ordinarily may be checked in a few minutes by the pressure of a pledget of gauze. It would naturally be supposed that the proximity of the meningeal and its fixed point at the foramen spinosum would be an embarrassment, especially when an attempt is made to liberate the third division by insinuating the elevator under the posterior border of the nerve,—N. mandibularis,—between it and the artery. This I have not found to be the case. I do not see how the third and fourth nerves can be injured in this procedure; the sixth, however, lies very near the ganglion, and has always been seen and, I must confess, injured in each of my 4 cases. This, however, has fortunately occasioned only temporary symptoms, the resulting internal strabismus having disappeared in each case in the course of a few weeks. In one instance I felt certain that I tore the nerve across; if so, it must have regenerated. There has also resulted in all of my cases a temporary paralysis of the sympathetic, with contracted pupil. This has invariably disappeared much earlier than the motor paralysis of the abducens. As previously stated, it is well in the liberation of the first division—N. ophthalmicus—to free the nerve at the ganglionic end and to strip it out from behind forward if it is desired to remove it at all, else the cavernous sinus may be injured. This action, however, is by no means such a calamity as it is credited with being. The sinus is not an open canal, as usually believed, but is made up of compartments, in which local thromboses may occur readily and promptly, and thus hemorrhage be controlled by a few moments of pressure. Bleeding from the small ganglionic arteries about the foramen ovale may be much more annoying. On one occasion I accidentally plunged the dissector directly into the sinus anterior

to the ophthalmic border of the true ganglion. The profuse momentary hemorrhage ceased after a few moments of pressure with some gauze. The trigeminal sensory, if properly extracted, invariably comes away from the pons, where it is loosely attached. I have never seen any evidence of shock consequent upon this procedure such as Horsley describes in his single case.

"5. *Closure and Dressing.*—The zygoma and flap of skin, muscle, and fascia are replaced. The zygomatic arch in my first case, as stated, was removed, and in one of the later ones wired in position. This is an unnecessary detail, inasmuch as the masseter is paralyzed, and the resected portion of the bone remains in position when replaced. The temporal muscle and fascia are secured in place by fine interrupted sutures at the upper curve of the incision, and a few sutures are taken in the divided periosteum and fascia over the replaced zygomatic arch. In applying the dressing the eye is covered by a large sheet of rubber protective, which bridges across from the nose and forehead to the malar prominence of the cheek, and prevents the pressure of the bandage against the eye. In none of my 4 cases has the wound been drained, and in none has there been failure to obtain healing by primary union; the resulting scar has been very slight, and in one instance hardly to be detected. An unsightly scar, such as is shown in many photographs of cases, would almost deter a surgeon from the operation. I have not found it necessary to suture the lids, as has been advocated, in treatment of the eye. In fact, I should think the local reaction resultant to this procedure would be detrimental in case there was an ensuing keratitis, which apparently is at times unavoidable."

W. W. Keen, F. X. Dercum, and W. G. Spiller¹ report a remarkable case of **endothelioma of the Gasserian ganglion**. Two successful resections of the ganglion were performed: first, by the extradural method; and, secondly, by an intradural operation.

Tichonowitch² advocates the **method of Quénu in operating for neuralgia of the fifth nerve**, and maintains that it gives the freest access to the Gasserian ganglion. Comparatively little bone requires removal, and the course pursued to arrive at the foramen ovale is without danger. This route is between the bone and the periosteum. No large vessels are encountered here and the middle meningeal artery can be readily located. The opening made into the bone is small.

Gwilym G. Davis,³ in operating for the exposure and **removal of the Gasserian ganglion**, advocates **preliminary ligation of the carotid artery** above the digastric muscle. When a ligature is placed on the artery in this region, the blood is still able to ascend to the scalp through the occipital and posterior ocular arteries. After the carotid has been ligated, the ordinary horseshoe-shaped flap with a base on the zygoma should not be made, because it will be liable to slough, the main blood supply through the temporal artery having been cut off by the ligation of the external carotid. The flap should be made the shape of

¹ Jour. Am. Med. Assoc., April 28, 1900.

² Centralbl. f. Chir., Mar. 24, 1900.

³ Jour. Am. Med. Assoc., April 28, 1900.

a truncated cone, the base being upward. The bleeding during the operation performed by this method is not troublesome.

J. Lynn Thomas¹ furnishes notes on 2 recent operations upon the Gasserian ganglion and the second and third divisions of the fifth nerve for neuralgia by the **Hartley-Krause method**. In both patients the operation was carried out at one sitting. In one he replaced the bone; in the other he did not, because of injury to the middle meningeal artery. This accident taught him that it is desirable to divide the posterior limb of the bone before attacking the front part, for it is at the front that the artery is liable to be injured. In one of the cases the frontalis muscle and the corrugator supercilii are paralyzed, and there is resulting a unilateral, smooth, creaseless forehead when the patient raises his brows, as in the expression of surprise. This deformity can be obviated by making a short anterior limb to the horseshoe incision, thus avoiding dividing the branches of the facial nerve which supply the muscles. He describes a new method of preparing the scalp. The hair is removed by means of a nonirritating powder, which also affects the surface epithelium and any microbes contained thereon. It requires 4 minutes to remove hairs from the scalp. The scalp is wetted and the powder is dusted on and rubbed in until a thick, moist coating covers the surface. At the end of 4 minutes the scalp is shaved with a spatula. The only other preparation he has applied to the scalp is a warm carbolic fomentation for 1 hour, to prevent further contamination of the field of operation. The active ingredient of the powder is sulphid of barium. It will act only in the presence of water and not in the presence of soft soap or vaselin. After operating upon the ganglion and its second and third divisions, the author plugs the foramen rotundum or foramen ovale with Horsley's wax or with the mercury amalgam which is used by dentists.

George P. Suker² advocates the **excision of the superior cervical ganglia** of the sympathetic for all forms of **glaucoma** except the hemorrhagic, and he maintains that it will be proper treatment for epilepsy and exophthalmic goiter. In this paper he reports a case of glaucoma improved by the removal of the superior cervical ganglion on each side.

Emory Lanphear,³ in a paper on the **removal of the cervical ganglia of the sympathetic**, thus describes the technic: "After thorough preparation an incision is made from the tip of the mastoid to the acromion, and the sternomastoid muscle is quickly exposed, the external jugular being ligated and cut. The upper part of the sternomastoid may have to be split. The great vessels and the pneumogastric are then exposed by blunt dissection, and when thoroughly bared, are lifted upward and forward, and the upper ganglion is searched for. When found, it is to be carefully dissected out without rupture of its connecting filaments with the middle ganglion, as these must be the guide to the middle and lower ganglia. At this point the efferent nerves must be cut; they are the filaments which go to the eye. The upper ganglion having been liberated, the sympathetic tract is followed down-

¹ Brit. Med. Jour., Oct. 28, 1899.

² Medicine, April, 1900.

³ Va. Med. Semi-Monthly, Nov. 10, 1899.

ward to the little enlargement called the middle ganglion. There is really no cause for removal of this ganglion, as it is in no way connected with the pathology of the disease; it is merely a matter of convenience in reaching the lower, and in this disease the most important, ganglion. Some difficulty is experienced in locating and removing this, as it often lies in part behind and below the outer end of the clavicle. It is, when dissected loose, removed with scissors and the wound packed firmly with gauze to control oozing, which is not serious. When all oozing is checked, the great vessels are allowed to fall into place and the deep fascia is sutured with catgut, great care being exercised that no "dead spaces" are left as possible foci of infection. About two other rows of sutures are needed perfectly to close the wound. The cut in the skin may be closed as best suits the operator; I prefer chromicized catgut. The entire head, chest, and neck are then enveloped in sublimate gauze, cotton, and starch bandages, the probability of infection being great unless extreme care is taken in applying the dressings. With children (in the same operation for epilepsy), in addition to the starched crinoline dressing of the wounded parts, I would advise the application of a small amount of plaster-of-Paris bandage around each elbow, so that the fingers can not possibly be brought to the wound. The dressings are allowed to remain for from 6 to 10 days, until operation on the opposite side. Some European operators have advised operation upon both sides at the same time. I do not believe it is proper, especially in goiter, where the heart is so disturbed that prolonged anesthesia must be highly dangerous; and in an operation which, from its peculiar character, so profoundly affects cardiac action. If performed under ideal asepsis, there is absolutely no pain following the procedure, and the discomfort of the stiff dressing and recumbent posture is not sufficient to cause the patient to reject the second operation."

Thomas Jonnesco¹ strongly advocates the **resection of the cervical sympathetic in the treatment of epilepsy, exophthalmic goiter, and glaucoma.** He thinks that the time has come to place this operation among the noteworthy achievements of modern surgery. Surgeons have different views as to the extent of the operation necessary. Some remove but a small portion of the superior ganglion and of the cord beneath; some remove the superior and middle ganglia; others remove the entire chain. At any rate, the principle of removal of the ganglia has triumphed over that of simple nerve section. Jaboulay believes that total extirpation is alone able to interrupt all sympathetic nerve impulses to the thyroid gland, the eye, and the heart, so far as acceleration is concerned. The nerves to the eye come from the superior ganglion; the vasodilator and secretory nerves of the thyroid gland come from the inferior ganglion; and the cardiac accelerator branches come from the inferior ganglion. Excision of only the superior ganglion for goiter or epilepsy is irrational, because it will influence only the eye. Jonnesco is so strongly convinced of this that in his 8 patients, except the first two, he resected the entire chain—7 times on both sides and once on

¹ *Medicine*, Aug., 1899.

one side only. The operation, although delicate, is harmless and easy. One side should be operated upon at a time, and a week later the other side can be attacked. The object of the operation in epilepsy is radically to alter the cerebral circulation and to convert a confirmed anemia into a permanent hyperemia, and thus to improve the nutrition of the nerve-cells and remove toxic materials contained within them. In reflex epilepsy the object is to cut off the channel by which impulses are transmitted from the viscera to the brain. To accomplish this, some simply cut the sympathetic; some remove the superior ganglion, the middle ganglion, the inferior ganglion, or the inferior and middle together. Removal of the superior ganglion inhibits vasomotor influences on the carotid region, and removal of the inferior does the same in the vertebral region; but in order completely to change the vasomotor conditions of both these sources of cerebral blood supply, both the superior and inferior ganglia should be removed; and if we desire completely to interrupt the transmission of impulses from the viscera to the cranial centers, the entire sympathetic must be removed. Hence in both epilepsy and exophthalmic goiter the complete bilateral resection is the only logical method; whereas in glaucoma extirpation of the superior ganglion alone is sufficient. Among the postoperative manifestations are congestion and warmth of the face, an increased flow of tears, nasal mucus, perspiration and saliva, and reddening of the conjunctiva on the affected side. Resulting from the operation, and continuing permanently, are contraction of the pupil, with paresis, ptosis, and sinking of the eyeball deeply within the orbit—all these phenomena being brought about by paresis of the pupillary dilators, of the smooth muscles of the upper lids, and of those in Tenon's capsule. There are no remote effects from the operation, not the slightest trophic disturbance; in fact, it clearly benefits the nervous condition of exophthalmic goiter. The author then quotes numerous statistics to prove the value of the method. [Janesco's operation is founded upon a hypothesis; that is, upon something more shadowy than a theory. Its advocates speak of the functions of the sympathetic as positively as they might speak of the actions of the slide-valve of a locomotive or the mainspring of a watch; and yet the functions and powers of the sympathetic are but partly known, and for the most part are dimly estimated. The real value of the operation is doubtful. It is certainly not free from danger. The theory upon which the operation is founded is said by Dana to be an exploded theory. In reading the statistics it is necessary to bear in mind that the effect of operation *per se* upon exophthalmic goiter may pass away after a shock, after prolonged rest in bed, after an indifferent or even a distant operation, and also spontaneously, as well as after medicinal treatment or after an operation on the sympathetic. Exophthalmic goiter is often associated with hysteria, and almost always with emotionalism, and Jaboulay says that operation upon the sympathetic will fail to cure if hysteria is markedly present. Rehn's report¹ is in favor of thyroidectomy rather than operation upon the sympathetic. In 177 cases thy-

¹ Berl. klin. Woch., Oct. 15, 1899.

roidectomy was performed : 57.6 % were cured ; 26.5 % were improved ; 2.3 % were not improved ; and 13.6 % died. In 32 cases the sympathetic was operated upon : 28.1 % were cured ; 50 % were improved ; 12.5 % were not relieved ; and 9.3 % died. Rehn's report shows that over twice as many cures follow thyroid extirpation as follow operation upon the sympathetic. The mortality after thyroidectomy was slightly heavier, but then only 32 cases were subjected to operation upon the sympathetic, and in 177 cases thyroidectomy was performed. We believe that the majority of cases of Graves' disease can be treated by rest and medicine ; and when these fail, operation should be considered. If the gland is extremely small, thyroidectomy will do no good ; if the gland is very large, it will probably fail. If it is of moderate size, if the goiter is increasing, if there are distinct respiratory disturbances, if the pulse is very rapid, medicinal treatment having failed or the patient having disregarded the necessary restrictions, perform partial thyroidectomy. In a large goiter it is justifiable to tie the thyroid arteries. If suffocation is threatened, tracheotomy is necessary if thyroidectomy is rejected. The experimental operation upon the sympathetic may be performed if a patient rejects thyroidectomy, or if thyroidectomy is considered inadvisable or improper.]

Mondol¹ reports the case of a man who had attempted suicide. He had fired 3 shots, and 1 bullet had been found and removed. Three years later he showed amnesia and other evidences of mental failure, and had also occasional attacks of fever. A skiagraph showed the presence of a **bullet in the brain**. After the patient had been brought into the hospital he became acutely insane, and was removed for a time to the insane department ; but later he was brought back and was trephined. The bullet was found lying at a depth of 5 cm. in the brain, and after the operation the patient completely recovered.

Gangolphe and Piery² write on **lesions of the lateral sinus** associated with injury of the cranium. They report the case of a man, aged 55 years, who was found lying at the bottom of a stairway in a state of coma, the left side being hemiplegic, the muscles of the right side being contracted. Nothing was known as to how he had been injured. There was a very trivial scalp wound and evidences of fracture of the skull, and it was therefore thought that the condition was due to hemorrhage. The individual died, and a postmortem examination showed that there was a fracture of the occipital bone, which had injured the lateral sinus of the right side, and as a consequence there was a profuse hemorrhage between the dura mater and the bone, the hemorrhage having spread over the greater portion of the temporal lobe and the second parietal lobe. The authors have found records of 7 cases similar to the foregoing, and they reach the following conclusions regarding them : (1) Traumatism of the skull may injure the lateral sinus, this injury being a rupture if the sides of the fracture are widely separated, or being a tear effected by portions of the bone or by foreign bodies. (2) A tear or rupture of the lateral sinus is followed by extensive hemorrhage and clot-formation between

¹ Rev. de chir., Nov., 1899.

² Rev. de chir., Sept., 1899.

the dura and the skull, and often there is associated with the extradural hemorrhage a hemorrhage into the arachnoid. (3) The symptoms are very variable and not unusually resemble those of an ordinary apoplexy. (4) An absolute diagnosis is usually impossible. (5) In any case in which the diagnosis is uncertain, the patient having had an apoplectiform attack and a preceding injury, the surgeon should always act as if he were sure that there was a traumatic hemorrhage of the brain. (6) The proper course of procedure is as follows: If the sinus is exposed by the injury, remove fragments of bone and pack the wound with gauze; but if the sinus has not been exposed by the injury, it should be exposed at once by trephining, the trephining being carried out where the traumatism was applied and not in the region to which the symptoms might point as the spot where there was a localized cerebral injury. Trephining at the point indicated by localizing symptoms has led surgeons into error, so that another trephining was necessary to reach the seat of trouble. When the wound in the sinus is found, it is packed with iodoform gauze. [In such a case the clot is so extensive that localizing symptoms are scarcely to be expected. A late localizing symptom might direct us to the margin of the clot when the lesion was many inches away. An early symptom, if any occurs, would be of great importance. We agree with the authors that in these cases trephining should be employed at the seat of application of traumatism rather than at a point indicated by late localizing symptoms.]

Hugh T. Patrick,¹ in reporting some additional cases of **brain tumor**, formulates the following conclusions: "(1) The symptomatology of brain tumor is exceedingly variable. (2) All the so-called general symptoms may be absent, all focal signs may be absent; it may be impossible in a given case to affirm or to deny the presence of an intracranial growth. (3) In the presence of indubitable signs of brain tumor it may be impossible accurately to localize it. (4) In every case of cerebral disease, whether it appear to be functional or organic, the history should be minutely scrutinized and every detail in symptomatology carefully elicited as the only means of avoiding gross errors. (5) The surgery of brain tumor is exceedingly unsatisfactory in every respect and the results are far from brilliant."

Charles K. Mills, W. W. Keen, and W. G. Spiller² report a **tumor of the superior parietal convolution** which was accurately localized and successfully removed by operation. The tumor measured $5\frac{1}{2}$ cm. by $4\frac{1}{2}$ cm. and weighed 1 ounce 3 drams. The tumor had begun as a subcortical growth, and had later burst through the cortex. With the tumor was removed a long cyst, like the finger of a glove, which passed for 10 cm. into the substance of the brain and contained from $1\frac{1}{2}$ to 2 ounces of blood. The tumor was an endothelioma. The patient completely recovered.

Küster³ advocates an **osteoplastic method of operating upon the mastoid process**. He makes a flap by means of a chisel, the flap

¹ Chicago Med. Recorder, Jan., 1900

² N. Y. Med. Jour., May 12, 1900.

³ Centralbl. f. Chir., No. 43, 1899.

containing skin, periosteum, and bone from above the mastoid sinus. The base of the flap is toward the ear. The periosteum is exposed to a degree just sufficient to permit the chisel to mark out 3 sides of the flap. After the flap has been turned back the operation on the sinus is carried out. After finishing work on the sinus it is packed with gauze, an end of a piece of gauze is carried out from the wound, and a bit of bone is cut from the bone-flap by means of rongeur forceps, so as to permit of the passage of the gauze; the flap is then sutured in place. This operation is followed by an ordinary linear cicatrix and the form of the bone is preserved. It is just as easy as any other method.

Lucae¹ reports a case in which he **opened the mastoid process for a suppurative condition** and exposed the dura. After this operation there was a discharge of cerebrospinal fluid, which continued for about 5 weeks and then ceased. No cerebral trouble arose because of this. There was no rise in temperature and there were no brain symptoms.

DISEASES OF THE MUSCLES, FASCIA, ETC.

A case of **rupture of the plantaris muscle** is reported by J. H. Gibbon,² who thinks the injury is due not so much to excessive muscular strain as to lowered tone from obesity or muscular tire. Rupture of deep varicose veins has been offered as an explanation. The writer thinks that the loose elastic bandage of Randolph, followed by massage, is preferable in treatment to fixed dressings of plaster. Rest and elevation of the limb are also important.

In a paper on the **histology of Dupuytren's contraction of the palmar fascia**, with microscopic report of 2 cases, J. B. Nichols³ concludes that in the stage of development of this condition, the cellular and vascular elements occur in great abundance, but in the later stages these elements diminish, leaving a dense fibrous mass. The process is a hypertrophy, caused by proliferation of connective-tissue cells, which are very abundant along the courses of the small blood-vessels. The etiology must therefore lie in some disturbance of the relations between the vascular supply and the connective-tissue cells. In the author's cases Pacinian bodies were found in each.

A case of **contraction of the plantar aponeurosis** occurring in conjunction with contraction of the palmar fascia is reported by Féré.⁴ The conditions are very nearly similar—pain on standing, contraction, with thickened fascia. The symptoms of the plantar involvement are pain along the inner margin of the foot, markedly at the posterior insertion of the fascia, with difficulty in walking and a tendency to turn the foot outward and to walk on the outer margin, and with transverse wrinkles, due to the contraction, in severe cases. Pain can not be considered as an invariable symptom of contracted fascia, as it is found when the fascia is hyperextended, in neurasthenia, and in loss of muscle-

¹ Berl. klin. Woch., Oct. 2, 1899.

² Phila. Med. Jour., May 19, 1900.

³ Med News, Oct. 14, 1899.

⁴ Rev. de Chir., Sept., 1899.

tone, as in obesity. The writer thinks that there is a neuropathic basis for the affection, as his case occurred in a patient having such tendency in marked degree. Contractions of the palmar fascia were also noticed in the same case.

In reviewing the **operative treatment of spasmodic torticollis**, E. Kalmus¹ comes to the following conclusions: The prognosis is unfavorable except in very recent and in hysteric cases; the disease in some cases remains stationary after reaching a certain stage, while in others death may ensue from exhaustion. Medicine is of slight use, but electricity may be tried; galvanism being used on the affected side, while the faradic current is used on the sound side. Massage, orthopedic apparatus, and operation are other methods of treatment. After consulting the literature, and with a personal experience of 95 cases, the writer thinks that the best results are attained by resection of the nerves of the affected muscles, although in some cases resection of both nerves and muscles is indicated.

DISEASES OF THE SPINE.

The principles of the treatment of injuries of the spinal cord is the subject of a paper by Percival R. Bolton.² After enumerating the various spinal injuries in detail, and discussing the causes which produce either regeneration or degeneration, he summarizes his conclusions as follows: The cells and fibers of the cord are easily destroyed and are never regenerated. Extradural hemorrhage causes no symptoms and needs no treatment. Total lesions of the cord are irreparable. In *hematomyelia* the clot is absorbed, its site persisting as a cavity, and no treatment will improve the condition. After partial contusion of the cord, permanent destruction of cells and fibers takes place, and no treatment is of avail. In open injuries of the cord destruction of cells and fibers takes place. But if a foreign body is introduced or infection takes place, then operation is indicated for removal of foreign bodies, disinfection, and drainage. In the discussion of Bolton's paper A. B. Johnson stated that he disagreed regarding the futility of operation in some cases, as he had removed a mass of tissue of new formation from the dura of the cord 3 months after a dislocation of the first lumbar vertebra with rapid recovery. Stimson pointed out the importance of making the distinction between crushing of the cord and *hematomyelia*. The former is hopeless, but the latter may be recovered from; the question, though, is one of prognosis, not of treatment. The general opinion is that fracture-dislocation of the spine is rarely benefited by surgery. Curtis thought the statement would have to be qualified regarding cases in which there is extradural pressure. He had removed a clot, following fracture of the fourth and fifth dorsal vertebræ, which was exerting pressure on the cord; and on removal, a distinct depression could be felt with the finger on the cord at the site of the injury. The dura was not

¹ Beiträge z. klin. Chir., vol. XXVI, p. 189; abstracted in Med. News, April 14, 1900.

² Ann. of Surg., Sept., 1899.

opened. The patient subsequently died from shock. Abbe stated that he had never seen any benefit except in one case, where there was fracture and crushing of the cord.

John C. Munro¹ read a paper before the American Medical Association on **laminectomy**, in which he reported 18 operations for spinal lesions. The author concludes that operation is nearly hopeless in cases of acute trauma of the upper half of the cord, although it should be done, as affording the only hope of cure. In cases of chronic trauma the benefit is great. In injuries to the lower half of the cord the prognosis of benefit is very good, especially if the cauda is involved. In tumors of the cord Horsley claims that 80% of cases are amenable to operation, while 75% of Starr's 100 cases could have been relieved by operative interference. The author states that in accident cases operation is contraindicated until the profound shock has passed away, and is also contraindicated when the cord is completely crushed. Ferguson, in the discussion, said that in his opinion complete laminectomy is a grave operation for the amount of benefit derived; his preference is for a hemilaminectomy, which relieves pressure on the cord. He also wishes emphasis placed on the necessity of early operation for injury. Bouffleur believes that shock is no contraindication to a laminectomy, but rather the opposite. In summing up, Munro said that lumbar puncture would not take the place of a laminectomy for pressure, and that a hemilaminectomy had no advantages over the complete operation. With regard to early operations, he thought the patient should be brought out of profound shock first.

Robert Abbe,² in an article on **spinal fracture and paraplegia**, reports 4 cases of this condition. The author calls attention to the lesion in one of his cases, where there was dislocation of the neck. The deformity had been previously considered to lie between the middle cervical vertebrae, yet the skiagraph showed a dislocation of the axis upon the atlas on one side. This was spontaneously corrected during sleep. In another case, where there was a comminuted fracture of the body of the fifth cervical vertebra, the depressed fragments were removed under cocaine 6 weeks after the accident, 15 drops of a 2% solution being used. Six months afterward sensation was normal over the entire body, and voluntary motor power was restored except for the anterior tibial groups. Abbe's method of laminectomy consists of "a straight incision, 6 inches long, to one side of the spinous processes, the knife passing between the muscle and the spines, directly down to the laminae; the muscles are separated by blunt dissection from the laminae on one side, and the tips of the spinous processes, with the interspinous ligament unbroken, are separated by cutting pliers. These, with the opposite side muscle, are dissected in the opposite direction. A rongeur is used to gnaw away the base of the spines and as many laminae as are required to expose the cord." The author concludes from his experience that if loss of motor and sensory phenomena is instantaneous and complete below the injury, with absent knee-jerks, recovery is almost hopeless, although one case of

¹ Jour. Am. Med. Assoc., Jan. 6, 1900.

² N. Y. Med. Rec., Mar. 3, 1900.

his with these symptoms recovered. If there is only partial loss, the outlook is hopeful, although wrist-drop or dragging of one foot may persist for 2 or 3 years. Laminectomy for spinal fractures should be done under cocain, before local meningitis sets in, a skiagraph having first been taken.

In an article on the utility of **early intervention in pathologic and traumatic fractures of the spinal column**, Delagènière¹ thinks that in injury to the spinal column the policy of delay should be abandoned, and early operation done, as many of these cases can be cured if there is operative interference at once. The author reports 2 cases, in one of which the operation was done early, with complete recovery; in the other the operation was delayed, and a condition was found which would have been entirely relieved by early operation. Absolute severance of the cord is the only lesion which can not be repaired by suture. [The expectations once cherished in regard to the future of operation for spinal injuries have scarcely been realized. After an injury of the spine no operation should be undertaken if there is paralysis of motion, persistent and complete anesthesia, and entire and lasting loss of deep reflexes. Such symptoms indicate complete division of the cord. In a fracture-dislocation below the axis, the cord not being completely divided, if there is no improvement in from 6 to 8 weeks, operate; but if signs of degeneration appear, operate earlier. Hemorrhage demands operative interference, and so does traumatic pachymeningitis. The results are not brilliant, as a rule. The best results follow when the cord was compressed, but not actually lacerated. If the upper half of the cord is injured, the prognosis is almost hopeless. It is much better when the lower part of the cord is involved. The best results are in injury of the cauda equina. The very early operation suggested by Delagènière is scarcely to be advocated except for hemorrhage.]

Trendelenburg² advises **laminectomy in cases of angular curvature**. The author's experience with 8 cases leads him to advocate resection of the arches of the diseased vertebræ, at the point of greatest curvature, when there is paralysis of the lower extremities, especially when there is reason to believe that there is pressure on the cord from narrowing or inflammatory deposit. In acute cases, where there is tenderness, operation is contraindicated, while an incomplete paralysis, even of long duration, is improved by operation. In 4 of the author's cases a cure resulted; laminectomy failed in 2. It is too soon to decide about the remaining 2, as improvement often is not shown until 6 months after the operation.

Otto Hahn³ is the author of a study of 41 cases of **acute infectious osteomyelitis of the vertebræ**. Of the cases in the author's table, 3 were his own. The writer concludes that the causative factors of this disease are the same as in other bones. The larger number of cases occur before the age of 20. The disease attacked the cervical region 7 times, the dorsal 12 times, the lumbar 17 times, and the

¹ Rev. de chir., Nov., 1899.

² Centralbl. f. Chir., No. 27, 1899.

³ Beiträge z. klin. Chir., Bd. xxv, Heft 1.

sacral 5 times. There was no proliferation of periosteum, as in osteomyelitis of the long bones. Inflammation of the cord and membranes was the chief complication, and it was found 12 times. In each case where bacterial examination was made *Staphylococcus aureus* was the germ found. The greatest difficulty lies in confounding the diagnosis of osteomyelitis of the vertebræ with other diseases; notably, spinal meningitis, typhoid spine, etc. The prognosis of this disease is grave, the degree of gravity depending on what segment of the column is affected; disease of the lumbar spine being most often fatal, although it has been considered that there was more danger the higher up the cord the disease lay. Prompt surgical interference is the best remedy, even if the osteomyelitis is a symptom of general pyemia.

In an article on **typhoid spine** by R. W. Lovett and Chas. F. Withington¹ a case is reported of this rather rare condition. Gibney first called attention to cases in which great pain and sensitiveness of part of the spinal column, simulating Pott's disease, follow enteric fever. Following him, Osler and others have reported similar cases, all occurring in young male adults. The affection occurs late in convalescence, or after the patient has resumed his work. In some cases the symptoms are those of a neurosis, and in others deformity occurs. In the case reported by the authors the deformity was due undoubtedly to a destructive osteomyelitis of the bodies of the lower dorsal and upper lumbar vertebræ, and there were, in addition, hysteric stigmata and symptoms of pressure. The clinical aspect of this case differed from that of Pott's disease in that the muscular rigidity seemed largely voluntary, the pain was excessive, tenderness of the spine was present, and the peripheral ends of the nerves were painful. The subsequent history, mobility of the spine returning in 9 months, is not that of Pott's disease. In analyzing the 9 reported cases of typhoid spine Osler inclines to the view that the condition is a neurosis, as his cases presented those symptoms. Gibney considers it a perispondylitis, and the authors think that while there may be cases of each, that possibly "an osteomyelitis or periostitis of the vertebræ is present in some cases which have been supposed to belong to the neurotic class." The treatment consisted in the application of a plaster cast, and later of a leather jacket.

Leonard T. Giles² reports a case of **recovery after excision of the sac of a spina bifida**. Pressure was first tried, without success. At the time of operation the sac just filled the hollow of the hand. A longitudinal incision 3 inches in length was made over the upper two-thirds of the tumor; the sac was reached; and, no nerve-trunks being found within, was removed, the pedicle being fixed on the distal side of the ligature. The child, aged 3 months, not being in good condition, the intention was not carried out of reflecting a layer of fascia over the wound. A drainage-tube was inserted in the upper part of the wound and the case made a good recovery. There was slight incontinence of urine, however, on screaming, which had not improved 2 months after operation.

¹ Boston M. and S. Jour., Mar. 29, 1899.

² Quart. Med. Jour., Nov., 1899.

The surgical treatment of tumors within the spinal canal is the subject of a paper by Putnam and Warren,¹ in which the conclusion is reached that surgical interference does little good in a majority of the cases. Thirty-six cases are tabulated, 3 of which are original. In 12 of the cases a fatal termination was apparently hastened by the operation; in 9 but slight change was noticed after operating, although recovery followed in 10 of the cases. In 2 of the recoveries the records are insufficient to prove the statement. In one of the cases, a fibroma of the lower dorsal region, removal did not produce cure, although the patient was greatly improved. In the other 2 cases, which were malignant disease of the cord, although the growth could not be removed, relief of pain followed the operation; but the authors do not feel sufficiently assured that the relief was due to the operation to recommend similar treatment in like cases.

Tumors of the cauda equina is the title of a paper by B. Sachs,² in which he reports 2 cases successfully diagnosed and removed. In the first case there was the history of an old gunshot wound, with muscular atrophy of both limbs. From the symptom-group the diagnosis was made of a tumor of the cauda equina. Laminectomy was performed over the third lumbar vertebra by Wyeth, and a tumor was removed from between the second and third lumbar vertebrae. Microscopic examination showed it to be an alveolar sarcoma. Relief from all the distressing symptoms followed. In the second case Gerster removed from between the second and fourth lumbar vertebrae a soft fibrosarcoma which was compressing the cauda equina. In this case also the patient made a good recovery.

Albertin³ reported to the Lyons Surgical Society a condition following **spinal injury** for which he had performed **lumbar puncture**. There was paraplegia, absent reflexes, and large areas of cutaneous anesthesia, the sphincters not being affected. This condition persisting for 2 weeks, the author decided that an effusion was present, and therefore tapped the spinal canal with a trocar and drew off about 1 ounce of blood-stained fluid. The reflexes returned in 48 hours, and the improvement was slow but steady, and, the author believed, was due to the puncture, as the improvement was coincident with it.

J. Jackson Clarke⁴ reported 100 cases of **abnormal curvature and other affections of the spine**. The author divides the cases into groups. In Group 1 are 35 cases of lateral curvature, which can not be referred to any obvious morbid condition at the time of examination. Nevertheless several of these cases presented slight evidences of rickets or rheumatoid arthritis, which leads the writer to believe that a greater proportion would be shown to be due to these causes if they had been seen at an earlier stage. There are 7 cases in Group 2, due to pronounced rickets. Two of these cases were not among the poorer classes, and the author remarks that rickets of the spine is not confined to childhood. Rheumatoid arthritis is the cause of the 7 cases in Group 3, the

¹ Am. Jour. Med. Sci., Oct., 1899.

² N. Y. Med. Rec., Jan. 6, 1900.

³ Lyon méd., Oct. 8, 1899.

⁴ Brit. Med. Jour., Oct. 21, 1899.

ages ranging from 4 years to 55. In cases where the condition becomes troublesome in middle life, a slight spinal curvature may be found to have existed in childhood. Group 4 is composed of 20 cases of spinal deformity other than scoliosis, tuberculosis, or traumatism. An analysis shows that causes similar to those in the former groups have produced the disease: viz., anemia, rickets, and rheumatoid arthritis. In Group 5 are 20 cases of tuberculous disease, and in Group 6 are 11 cases of secondary or traumatic affections. By the foregoing method of grouping the author hopes to call attention to the pathologic basis of spinal deformities; the treatment is selective for individual cases.

DISEASES OF THE KIDNEYS AND URETERS.

David Newman¹ writes, from the standpoint of pathology, symptoms, and surgical treatment, on **calculi impacted in the ureter**. Obstruction occurs most frequently, first, at the upper end of the ureter; second, at the lower end. Pathology is discussed under the following heads: (1) Calculus impacted in one ureter, the other kidney being competent: (a) the stone causing complete occlusion of one ureter; (b) the stone causing incomplete plugging, with the escape of urine at intervals. (2) Calculus in one ureter, the other kidney being incompetent: (a) stone causing complete occlusion of the ureter of the working kidney; (b) the stone causing incomplete plugging, with the escape of urine at intervals. In the first class of cases where one ureter is completely occluded, the backward fluid pressure causes a diminution in the flow of blood through the kidney which results in atrophy of this and compensatory hypertrophy of the opposite kidney. If the obstruction is incomplete, the urine escaping at intervals, hydronephrosis results. Occlusion of one ureter with incompetence in the other, causing anuria, may arise from: (1) A reflex inhibition of the function of the opposite healthy kidney; (2) impaction of a stone at a previous date, followed by hydronephrosis, or atrophy of the kidney on the side opposite to the one recently attacked; (3) other unilateral diseases of the kidney, such as tubercular nephritis, pyonephrosis, or congenital absence of one kidney; (4) bilateral disease of the kidneys, including the various forms of Bright's disease, cystic degeneration, etc. The symptoms depend on whether one or both kidneys are involved. When one kidney is normal, the symptoms will depend on the character of the obstruction. The blocking of the ureter is usually preceded by attacks of renal colic, coincident with the presence of blood in the urine. If the obstruction is incomplete, signs of hydronephrosis result. If one ureter is completely occluded and the other kidney incompetent, suppression of urine soon follows. The diagnosis involves several important questions, the most important being the determination of the presence and location of a stone. Renal colic, with signs of hydronephrosis, followed by anuria, is not sufficient evidence of a calculus. A stone may sometimes be felt through the abdominal parietes. When it is situated in the lower third of the ureter, it may possibly

¹ Brit. Med. Jour., April 21, 1900.

be detected by passing the finger into the rectum or vagina. Cystoscopic examination may afford valuable information, as may also catheterization of the ureters. The treatment must depend on the state of the patient and on the morbid condition present. If there is reason to believe that one ureter only is blocked, and the other kidney normal, it is best to wait, as spontaneous recovery may occur. In the mean time palliatives may be employed. When the ureter of the only working kidney is occluded, operation must be undertaken. If the stone has passed through the muscular wall of the bladder and is just beneath the mucous membrane, it may be removed through the urethra in the female, or by suprapubic cystotomy in the male. When a stone can not be felt with the fingers, it must be removed through the abdominal parietes by the extraperitoneal route. After the kidney and ureter are exposed, the latter should be searched, and if a stone is found high up, it may be pushed up into the pelvis and removed by an incision through the convex border of the kidney. If a stone is not felt with the kidney *in situ*, the organ should be freed and delivered so as to permit a thorough inspection. If palpation of the extruded kidney fails to discover a stone, an incision should be made through the kidney on its outer aspect, through which a digital exploration of the pelvis and calyces is made. If a stone is found, after its removal the ureter should be explored by the passage of a ureteral catheter into the bladder in order to see that there is no obstruction.

J. Coplin Stinson¹ refers to a case of **nephrorrhaphy and stripping of the appendix through a lumbar incision for a right floating kidney and painful appendix**. The patient, a young woman, after a fall from a horse, struck upon her back. She began to suffer from pain in the right groin and abdomen, accompanied by dizziness and vomiting. Nephrorrhaphy was performed, the kidney being exposed through the usual lumbar incision. The peritoneum was opened on the outer side of the kidney and the appendix was drawn into the wound and examined. It contained a semisolid mass, which was expelled into the cecum by stripping the canal with the fingers from the tip to the open end. As it was normal, it was not removed. The peritoneum was sutured and the kidney fastened to the lumbar fascia. The skin wound was closed. Uninterrupted recovery followed.

Francis Jeffrey² reports a case of **suppression of urine of 60 hours' duration treated by operation**. The patient, a man aged 53, had suffered from complete suppression for 60 hours previous to admission. He was restless, his pulse was rapid and intermittent, and respirations were 24 per minute. He perspired freely and his tongue was moist. He complained of pain and tenderness over the left kidney region. By careful abdominal palpation a large swelling could be felt. A diagnosis of hydronephrosis was made and operation was undertaken for its relief. An incision was made in the left lumbar region. On opening the swelling it was found to contain clotted blood, as did also the kidney capsule. The kidney was larger than normal and much congested. The pelvis

¹ Med. Rec., Sept. 23, 1899.

² Lancet, Mar. 3, 1900.

was full of blood, but no calculus could be found in it or in the ureter. A drainage-tube was passed into the pelvis of the kidney and the wound was closed. Within 2 hours after operation urine was discharged freely from the wound, and 36 hours later nearly all was passed by the ureter. For some days an abnormal quantity was secreted. Then followed a decrease to normal. The pulse and general condition improved. The cause of obstruction may have been a calculus which was displaced by irrigation, pressure, or kinking of the ureter due to the blood-clot, or it may have been due to congestion of the kidney. An opinion is expressed in favor of operation in such cases as soon as the diagnosis is made, as a large number of cases in which a stone is not found recover after operation. Insurance was refused the patient after a recurrent attack, though the writer thinks that his life was not less valuable than before operation.

D. Wallace¹ discusses **movable kidney**, and states that he believes the postmortem statistics of movable kidney are fallacious, as the kidney is more firmly fixed after death than during life; nor does he think any satisfactory explanation has been given for the greater frequency of the occurrence on the right side than on the left, or among the poorer women who have borne many children than among the nulliparous. The emaciation, supposed to be a predisposing cause, he considers a result, more especially when there is gastro-intestinal disturbance. The condition comes on gradually except in cases of traumatism. The clinical symptoms are grouped as follows: (1) Simple mobility without symptoms; (2) pain of a dragging character on the affected side; (3) renal pain, which may be accompanied by hematuria, pyuria, or intermittent hydronephrosis; (4) gastro-intestinal disturbance, which may be accompanied by or end in neurasthenia. These symptoms do not always correspond to the degree of mobility. The affected kidney is usually healthy. Three classes of cases are considered in regard to treatment: (1) Those in which no treatment is necessary; (2) those relieved by wearing a pad; (3) those requiring operation. For the second class the writer prefers an air-pad, fixed to the corset and placed in position after the kidney has been replaced. The writer's method of operation is to pass 3 strong catgut sutures through the kidney substance and to anchor the kidney to the posterior abdominal wall as high up as possible. He freely separates and removes the perirenal fat, but does not scarify nor strip the capsule proper.

F. I. Pool² reports a case of **movable kidney** with hydronephrosis, and gall-stone in the same patient. She was 45 years of age. Her trouble had existed for 20 years, and recurred at long intervals. It consisted of severe paroxysms of pain in the right lumbar region, which also extended through in the direction of the groin. The paroxysms were accompanied by vomiting and there was jaundice. The urine was normal, and she stated that on several occasions she felt the bladder rapidly fill up with a sensation of relief. On examination the kidney was found to be enlarged and movable, and an operation for fixing and draining it was

¹ Scottish M. and S. Jour., p. 193, 1899. ² Liverpool Med.-Chir. Jour., Feb., 1900.

undertaken. The usual lumbar incision was made. At the back of the kidney was felt a large stone, which seemed to be in a dilated pelvis, but it remained behind on withdrawing the kidney, which was freely movable in the loose perinephritic fat. An exploratory incision was made through the anterior abdominal wall. The gall-bladder was found to be thickened, and contained a large stone, which was removed, and the opening in the gall-bladder was sutured to the edges of the abdominal wound. An incision was then made into the pelvis of the kidney, which with the ureter was explored, but no cause for the hydronephrosis was found. The capsule of the kidney was reflected, and, by means of fine green catgut, was sutured to the lumbar fascia. A drainage-tube was introduced into the pelvis of the kidney. Up to the time of the report the patient was doing well.

C. W. Mansell Moullin¹ writes on the causes and treatment of **movable kidney**. A distinction is made between a movable kidney and a floating kidney. In a floating kidney there is a true mesonephron. The kidneys are normally movable to a certain degree. A kidney is considered to be unduly movable when, after being displaced by forced inspiration with the patient in the erect posture, it fails to reascend on tranquil breathing; but if it retains its normal relation to the diaphragm, moving up and down with the latter, its movement is normal. The kidneys are invested by the perirenal fascia, strengthened on the left side by some fibrous bands, which have been shown to be a remnant of the fusion of the descending mesocolon with the primitive parietal peritoneum. On the right these have no relation to the kidney. The kidneys are said to be held in position by the intra-abdominal pressure and by the way in which they fit into the lumbar recesses, which in the male are deep, narrow, and pear-shaped, with the narrow end below, while in the female they are shallower and more cylindric. This difference in shape is usually more marked on the right side, owing to slight torsion of the lumbar spine. In the quadruped mammalia the kidneys are most secure, but this security is largely lost in the erect posture of man, owing to the fact that the backward and forward movement of the diaphragm is changed to an upward and downward movement; the peritoneal viscera and supporting fascia lie in front of, and not below, the kidneys; the lumbar recesses become broader and more shallow, so that it is not surprising that a slight cause, such as a sudden violent jerk, great lowering of intra-abdominal pressure, an increase in weight of the kidney without an increase in bulk, increases its range of motion. By way of treatment nephrorrhaphy is advised in all cases in which there is mobility associated with real distress. Pads are considered useless.

At the meeting of the British Medical Association on August 4, 1899, A. W. Mayo Robson reported 3 cases of **removal of the suprarenal gland** and gave a table of all reported cases. Attention is directed to the following symptoms of the disease: "(a) Shoulder-tip pain, probably explained by the fact that a small branch of the phrenic nerve passes to

¹ Brit. Med. Jour., Mar. 10, 1900.

the semilunar ganglia; (b) pain radiating from the tumor across the abdomen and to the back, not along the genitocrural nerve; (c) marked loss of flesh; (d) nervous depression with loss of strength; (e) digestive disturbance, flatulence, and vomiting; (f) presence of a tumor beneath the costal margin, right or left, at first movable with respiration, but soon becoming fixed; it can be carried into the costovertebral angle posteriorly, and can be pushed forward into the hollow of the palpating hand in front of the abdomen." In none of the writer's cases was bronzing of the skin present, probably because only one organ was affected. In operating an incision is made along the outer border of the rectus. This permits exploration of the tumor as well as of removal, if removal is indicated. It may be necessary to remove the entire kidney or a portion of it.

E. H. Fenwick¹ reports 2 cases of **renal papillectomy**. The symptoms were repeated, painless, and profuse hematuria, which by the use of the cystoscope was found to be renal. Operation was performed, the kidney delivered, and its pelvis explored and examined by a strong light. A villous tumor of an individual papilla was found. It was removed, and complete recovery followed in each case. The cases illustrate the value of an unexpected cystoscopy, as during examination on previous occasions bleeding and secretion of urine ceased, owing to nervous control; also the importance of examining the pelvis with a strong light and the needlessness of mutilating the cortex in examination. [The suggestion as to examination of a protruding kidney with a strong light is very valuable.]

Edgar Gascean² reports a case of **extraperitoneal nephro-ureterectomy** for tubercular disease. The patient was a young unmarried woman who suffered from a chronic cystitis which resisted treatment. Cystoscopic examination showed the bladder to be intensely inflamed. The right ureter was catheterized. The urine from it showed 2.4% of urea, with some albumin, and a sediment consisting of blood-corpuscles, granular casts, epithelium, and leukocytes. He was unable to catheterize the left ureter. The bladder urine showed 1.84% urea, with a sediment consisting chiefly of pus and a few casts and epithelium. Only one doubtful tubercle bacillus was found. By palpation the left kidney was found to be twice as large as the right. A diagnosis of pyelonephritis was made and nephrectomy was performed. Three weeks later there was a rise in temperature, accompanied by pain in the left lumbar region. A second operation was performed, during which the ureter was removed. It was enlarged and showed tubercular changes, as did also the kidney previously removed. After operation the patient greatly improved, the bladder symptoms gradually disappeared, and the patient considered herself well. Six months later the bladder symptoms recurred and microscopic examination showed that the organ was much inflamed. It was cauterized with the solid silver nitrate stick under ether. Five months later the patient was in excellent health, and cystoscopic examination showed the bladder to be in good condition.

¹ Brit. Med. Jour., Feb. 3, 1900.

² Boston M. and S. Jour., Dec. 28, 1899.

Edward Reynolds¹ discusses **tuberculosis of the kidney** as an indication for nephrectomy. He believes that surgical interference offers a good chance for recovery in primary and unilateral renal tuberculosis occurring in patients who are in fairly good general condition. Points of interest in 4 cases brought to him for treatment were, first, that not in any was the gravity of the condition recognized; second, that 3 of the 4 presented family histories of tuberculosis; third, that the condition was of long standing. The history of all the cases except those in which hematuria occurred consisted in long-continued debility, with frequency of and discomfort in micturition, and sometimes pain and tenderness referable to one kidney or ureter. The pain and tenderness in this, as in many unilateral renal affections, is not infrequently referred to the sound side, where it may even be intense. The methods employed in diagnosis are palpation over the kidneys and ureters, cystoscopy, catheterization of the ureters, inoculation of guinea-pigs with a portion of the urinary sediment from each ureter, and microscopic examination of the sediment. Nephrectomy was done in 3 cases. In one ureterectomy was necessary later, and the writer thinks that in future when the ureter is involved we should perform the operation of nephro-ureterectomy. In 2 of the cases operated on, 11 and 18 months respectively before writing, recovery was perfect, and in the third the same result was expected.

David Newman² discusses tuberculous disease of the kidney as regards etiology, pathology, and surgical treatment. He states that from a clinical standpoint tuberculous disease may be said to manifest itself in 3 forms: (1) acute miliary tuberculosis; (2) renal phthisis; (3) caseous nephritis. For the production of renal tuberculosis 2 conditions are necessary—the presence of a suitable nidus and the conveyance of specific organisms to the part. Probably because of its blood supply, the kidney has a remarkable power of destroying and eliminating organisms without undergoing any morbid change in consequence, which fact is explained by the assumption that the number of the bacilli is small, or that their virulence is not sufficient to overcome the protective power of renal tissue. Hence any condition which renders this power of resistance less effective makes the development of disease more probable. Lowering of resistance may result from Bright's disease, amyloid disease, congenital deformities or displacements of the kidney, injuries, or hemorrhage. The tubercle bacilli may reach the kidney by the following ways: (1) By the blood stream; (2) by invasion along the lymphatics of the kidney from foci in the lower urinary tract; (3) by contagion along the excretory ducts; (4) by continuity. With regard to the symptomatology of renal tuberculosis, pyuria with renal symptoms, pain which may be slight until the mucous membrane of the pelvis or calyces becomes involved, variation in temperature, vesical irritation with emaciation, and anemia are mentioned. In the diagnosis, which should be made early, examination of the urine furnishes important information. Polyuria, albuminuria, hematuria, and pyuria, with the presence of tubercle bacilli, are important considerations, as are also the effect of

¹ Med. News, Aug. 12, 1899.
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² Lancet, Feb. 24, Mar. 3, and Mar. 10, 1900.

injections of urinary sediment into guinea-pigs. Catheterization of the ureters is of value in determining the organ to which the disease is limited. The prognosis in renal tuberculosis is unfavorable, though spontaneous recovery may take place so far as the local development of the disease is concerned. Foci may become encysted and remain quiescent for an indefinite time, as is shown by postmortem examination of individuals who have died from other causes. As regards treatment, the operations of nephrotomy and nephrectomy are indicated: the former when the disease is limited to a small area of the kidney or has formed only one cavity, which can be easily drained; the latter when the disease is unilateral and extensive. Primary nephrectomy is the operation most likely to result in permanent cure.

Newman Hall¹ discusses **hematuria as an early symptom of tuberculosis of the kidney**, and cites illustrative cases. Attention is directed to 2 points of importance: viz., the etiology and the early diagnosis of disease of the kidney. Hematuria may occur independently of any preexisting tubercular lesion, or early hematuria may be a premonitory symptom of tubercular disease, antecedent to the development of a gross lesion. Late hematuria may be caused by destructive tubercular processes. The effusion of blood has been regarded by some old observers as the origin of pulmonary tuberculosis, and was distinguished by the term "*phthisis ab hæmoptoë*." Two conditions are necessary to the establishment of renal tuberculosis—the presence of a suitable nidus there, and the conveyance of the specific organisms to the part. The writer regards the effusion of blood as a suitable nidus, as the kidney, owing to its vascularity, has remarkable power in destroying and eliminating organisms from the system, the tubercle bacillus passing through without producing any morbid change in its structure. Two cases are referred to in which tubercular disease of the kidney followed injury to the organ. Two cases are also cited in which early hematuria was followed later by the development of tubercular kidney disease which required surgical interference. Profuse hematuria is rare in early tubercular disease of the kidney, but more common after destructive processes occur. At this time tubercle bacilli are most abundant in the urine. The value of inoculation of animals with urinary sediment as a means of diagnosis is referred to. Catheterization of the ureters is of great value in determining which kidney is involved.

Joseph Ransohoff² discusses **nephrotomy vs. nephrectomy**. The first case reported was one in which an operation for pyonephrosis was performed, and carcinoma and calculus were found. The next 2 were cases of hydronephrosis, one of which was traumatic. Reference is next made to acute suppuration of the kidney, which so often follows acute infectious diseases. Four cases are referred to in which recovery followed nephrotomy. The writer thinks that in acute abscess with pyelonephritis, nephrotomy should be done, as such processes are often bilateral. Two cases of chronic nontubercular nephrosis cured by nephrotomy are reported. The following advantages are claimed for

¹ Lancet, Aug. 26, 1899.

² Phila. Med. Jour., Aug. 6, 1899.

nephrotomy in pyonephrosis: (1) It is easily tolerated by the patient, even when he is greatly reduced by fever; (2) it enables one to determine the condition of the other kidney; (3) by it the saving of a small portion of renal tissue may favor recovery. The following propositions regarding the operations of nephrotomy and nephrectomy are given: The former should be done "(1) when the condition of the other kidney can not be ascertained; (2) when the reduced condition of the patient will not permit the major operation if this is indicated; the nephrotomy is then but the preliminary step, to be followed by nephrectomy as soon as possible; (3) when the operation reveals the presence of considerable kidney tissue and an approach to the normal on the part of the pelvis and proximal portion of the ureter; here a later ureteroplasty may assist the need of nephrotomy; (4) when there is evidence or suspicion of disease in the other kidney. Primary nephrectomy is indicated (1) when there is a sound second kidney; (2) when inspection of the exposed kidney shows many or large pouches that can not be drained; (3) when there is little kidney tissue left; (4) when an examination of the pelvis and proximal portion of the ureter makes it reasonably certain that a return to the normal can not take place; (5) in paranephritic and perinephritic suppurations when the kidney acts as a valve impeding successful drainage" (Israel). Renal tuberculosis is next discussed and 7 cases are reported. The following conclusions regarding the choice of operation in this condition are given: (1) When the operation reveals a strictly localized lesion, a partial excision or curettage should be done; (2) nephrotomy is indicated when uncertainty exists as to the condition of the opposite kidney or for the temporary relief of an acute sepsis, and when the condition of the patient will not permit the major operation; it is then to be followed as speedily as possible by nephrectomy; (3) unless unusual conditions call for nephrotomy, it is not to be advocated for renal tuberculosis; it may even do harm by autoinfection; (4) primary nephrectomy should be considered the normal procedure for renal tuberculosis when an operation is indicated. The following reference is made to the choice of operation in nephrolithiasis: When a kidney containing a stone is aseptic, nephrolithotomy should be done. In a few cases in which a marked pyelitis exists, suturing of the kidney is justifiable if the ureter is competent to act as a drain. When a kidney is enlarged and sacculated from secondary infection due to stone, nephrotomy and drainage are the proper procedures. As in calculous disease the second kidney is frequently involved and there is a marked tendency to recurrence in the same or the opposite kidney, the importance of determining the existence and condition of the other kidney before performing nephrectomy is emphasized. The following methods of doing so are mentioned: Careful attention to the history and symptom-complex, diligent study of the urine, cystoscopy, catheterization of the ureters, and the use of the Harris segregator. A preference is expressed for the lumbar incision over the transperitoneal in exploration of the kidney alone. It entails less danger and affords greater facility for inspection of the kidney.

Leonard Freeman¹ discusses some considerations relative to the **diagnosis of surgical diseases of the kidney**. Hematuria and pyuria are referred to. When blood or pus is present in the urine, it is important to determine its source. The cystoscope and catheterization of the ureters furnish important knowledge. Blood or pus from the kidney is usually much more intimately mixed with the urine than that from the bladder or urethra. On voiding the urine into two glasses, if one contains more blood than the other the bladder or urethra is probably the source; if they are uniformly contaminated, the kidney; microscopic examination alone can determine positively the absence of hematuria, because the bleeding, though sometimes profuse, is often trivial in amount. Excessive bleeding occurring while the patient is asleep points to malignant disease or tuberculosis, though it is apt to be more profuse in the latter than in the former. Slight hemorrhage occurring after jolting of the body points to the existence of stone. A few blood-cells are sometimes found in connection with movable kidney, nephralgia, foreign substances in the urine, as sharp crystals, and irritative poisons. When pyuria exists, the two-glass test referred to may be used, though in this it is less reliable. The quantity of pus is no index to the extent of the disease, as in renal tuberculosis the kidney may be filled with tubercles and but little suppuration occur until an ulcer of the pelvis results. In renal calculus pus does not appear in the urine until infection takes place. Unless the microscope is used, phosphates, epithelial cells, or casts may be mistaken for pus. In examining urine from female patients vaginal and menstrual discharges must be excluded. *Bacteria*: The colon and tubercle bacilli are mentioned. *Casts* may exist in abundance in movable kidney. Hyaline casts may exist in nephrolithiasis. *Reaction of the urine*: Many infective processes of the kidney and bladder tend to render the urine alkaline. This is not always the case when the infection is due to the colon or tubercle bacillus. *Crystals*: Oxalate of calcium and uric acid crystals often cause pain, irritation, and reflex disturbances. Such deposits are seldom found in urine from a kidney badly damaged by disease. *Pain and tenderness* are important symptoms, but should not be made the basis for any diagnosis. Pain the cause of which is in the kidney may be felt at different points, as below the ribs anteriorly, in the region of the appendix, or in the testicle, urethra, prostate gland, bladder, or opposite kidney. Movable kidney sometimes causes discomfort, which in women may simulate disease of the pelvic organs. In doubtful cases examine the kidneys. Dorsal pain of renal origin is usually most intense in the angle between the last rib and the spinal muscles. Pain arising from the pelvic organs is most intense lower down. Pain arising from movable kidney or calculus is felt most when the patient moves about or jolts the body in any way, and has a tendency to subside after prolonged rest in the recumbent posture. The intensity of the pain in renal calculus depends much on the shape, size, and location of the stone. Calculus may exist without any symptoms. *Palpa-*

¹ Denver Med. News, Feb., 1900.

tion: In order that it may be satisfactory it is often necessary to anesthetize patients, especially fat or muscular ones. When the kidney can be felt anteriorly at the end of deep inspiration, it may be assumed that it is either enlarged or movable. Movable kidneys can often be detected most readily with the patient standing and bent forward upon a chair. With the fingers of one hand depressing the abdominal muscles and those of the other in the lumbar region, an enlarged or displaced kidney can sometimes be thrown from one hand against the other. Percussion is not considered very satisfactory. An important aid to diagnosis is the relative position of the colon. If it lies in front of a tumor, the latter is almost certain to be nephritic. *Exploratory incision*, which is almost devoid of danger, furnishes information which can not be obtained in any other way. *Röntgen rays*: The writer regards the results obtained by this means as uncertain. Which kidney is diseased? This is determined by study of the symptoms, combined with palpation, and by the use of the cystoscope and the Harris urine segregator. The question of whether or not there are two kidneys can usually be settled by the use of the cystoscope and the Harris segregator, combined with catheterization of the ureters. Exploratory incision for this purpose is not considered advisable.

Lucas-Championnière¹ discusses the operation of **nephrorrhaphy for floating kidney**, which he states has only comparatively recently been substituted for nephrectomy. A distinction is made between medical and surgical floating kidney, the most important point being the fact that the former never leaves the hypochondrium and is always in close relation to the diaphragm. The condition is not considered a part of general enteroptosis, as all abdominal symptoms disappear after operation. The female sex, child-bearing, and rapid emaciation are considered predisposing causes. The right kidney is most frequently involved. A fall is often an exciting cause. Pain, digestive disturbance, and neurasthenia are mentioned as symptoms, the first being the most important. The medical variety is treated by the application of an abdominal binder; in the surgical form nephrorrhaphy is indicated. In this operation the incision is made beneath the twelfth rib, over the kidney, which is exposed and is sutured to the muscles or aponeurosis. The outer wound is closed, except for drainage. The writer has a record of 26 successful cases of nephrorrhaphy. [It is not always the case that all abdominal symptoms disappear after operation. Sometimes pain continues. A condition of neurasthenia in a hysteric woman is rarely benefited by operation.]

J. Wesley Bovee² discusses **ureterectomy**; that is, partial or complete removal of the ureter. Total removal was first performed by Poncet, in 1893, and the first partial removal was done by Tuffier, in 1891, since which time the total operation has been done in 9 cases and the partial in 11 cases. The following indications for the operation are mentioned: In nephrectomy for tubercular lesion, providing the ureter be diseased; old dense cicatricial stricture renders ureterectomy advisable

¹ L'abeille med., Oct. 7, 1899.

² Ann. Gynec. and Pediat., Jan., 1900.

when nephrectomy is done; also hydro-ureter with hydronephrosis; rarely syphilitic stricture makes it necessary. The methods referred to are the transperitoneal and the extraperitoneal, and the former is advised in primary operation. The best route for the latter is through an incision extending from the last rib, in front of the sacrolumbar muscle, obliquely over the anterior superior iliac crest, down parallel with Poupart's ligament to the external abdominal ring. Care is necessary to avoid the peritoneum, round ligament, spermatic cord, the vessels around the inguinal canal, the sigmoid and cecum, and ovarian and uterine vessels. For removal of the lower portion of the ureter in the female the vaginal roof is incised along its course.

At the meeting of the American Association of Genito-urinary Surgeons in 1900, the best method of **obtaining urine direct from the ureters** for diagnosis was discussed. F. T. Brown¹ considered that way preferable (1) which was applicable to both sexes; (2) which secured the individual secretion of each kidney from contamination by the secretion of the other kidney or by material from any portion of the tract; (3) by one which effected these requirements with the least discomfort to the patient, and the least risk of immediate or remote harm to any of the parts involved; (4) and by a method which called for the simplest technic. The methods of Simon, Pawlik, Kelley, Harris, and the ureteral cystoscope were referred to, and preference was expressed for the latter except in a few cases. Brown presented his double-barreled ureteral cystoscope, for which he claimed the following advantages: (1) In favorable cases both ureters can be catheterized at approximately the same time; (2) in less favorable cases, after passing one catheter the second channel can be used to draw the distending fluid from the bladder, thus giving the organ repose; (3) in still more difficult cases the second barrel can be used for irrigation of the bladder until the viscus is distended with clear fluid, enabling the ureters to be located; (4) in some cases in which but one ureter can be catheterized the urine coming from the other ureter can be collected by catheter siphonage through the second barrel. W. K. Otis does not believe that there is any way of differentiating urines in all cases, it being sometimes impossible to catheterize the ureters. The danger of infecting the kidney is referred to. M. L. Harris referred to the use and limitations of catheterization of the ureters and of the segregator. The former was most useful in determining the nature and location of obstruction of the ureter, in locating the ends of a divided ureter or acting as a guide in intrapelvic operations, and in tapping and draining fluid accumulations in the renal pelvis. For the purpose of obtaining urine for examination it has its limitations, such as temporary anuria, contamination of the urine with blood and epithelial cells from the ureter, and infection of a healthy kidney. The segregator has its use in differentiating between certain bladder and kidney lesions and in determining which kidney is diseased. It is free from the danger of infecting a healthy kidney.

Structure and Function of the Kidney.—Allesandri,² as a result

¹ Med. Rec., May 19, 1900.

² Rev. de chir., Nos. 8 and 9, 1899.

of careful study of injuries of the kidney and blood-vessels in which nephrectomy was necessary, performed a series of experiments, from which he makes the following deductions: First, the ligation of the renal vein is not incompatible with the life and nutrition of that organ, and may not even constitute a serious danger to the body; second, it is possible that the collateral circulation may be established with the return of complete functional activity; third, in injury of the renal vein it is always prudent to ligate it rather than perform nephrectomy. Ligation of the renal artery in the dog can be done without producing rapid and complete loss of the kidney, and with a good chance that the organ will recover its function in a great measure, and it is thought that in the human being it gives a good chance of obtaining the same results. It was found that ligation of both vein and artery is incompatible with the life and function of the renal epithelium; that while collateral circulation is established with sufficient rapidity to prevent necrosis of the organ, there occurs a rapidly progressing cirrhosis, which strangles little by little the canaliculi and glomeruli, and as a consequence normal function does not take place in any part of the kidney structure which may undergo fibrous change.

Henry Morris¹ discusses **ureterotomy and pyelotomy**. By the former is meant longitudinal division of some part of the ureter; by the latter, an incision into the renal infundibulum for the purpose of testing the patency of the ureter, exploration for calculus, or removing an obstruction from the lumen or wall. Unless the ureteral sound can be passed along the ureter from the wound in the convex border of the kidney, one or the other of these procedures should be employed. In the male the lumbo-ilio-inguinal incision permits the exposure of the whole ureter. In the female it is best exposed by the sacral or vaginal route. Intraperitoneal and transperitoneal ureterotomy are condemned, except when done for exploration in the course of other operations. Three extraperitoneal routes are mentioned: First, the lumbo-ilio-inguinal, in which the incision extends from just below the costal border laterally, obliquely over and above the anterior superior spine, parallel to and an inch above Poupart's ligament, down to the external abdominal ring; second, the sacral route, which is best adapted for the male; third, the vaginal route, of limited application. When the ureter is exposed by any route, it should be incised longitudinally; and, unless dilated, sutures are not recommended, although some surgeons claim that they hasten healing and prevent the escape of urine and fistula-formation.

The Medical News of August 12, 1899, refers to an article by Reynolds, published in the same paper, on **nephrectomy in tuberculosis of the kidney**. The following methods of diagnosis are referred to: Catheterization of the ureters in both sexes, centrifugation of the urine and injection of the sediment into susceptible animals, and the discovery of tubercle bacilli in the urine. The results reported by Reynolds justify a hopeful confidence in the future of renal surgery for tuberculous conditions.

¹ Clin. Jour., July 5, 1899.

The British Medical Journal, July 22, 1899, refers to a paper read at the meeting of the American Medical Association in 1899 by Joseph Ransohoff on **nephrectomy versus nephrotomy**.¹ The latter operation *per se* is regarded as being nearly devoid of danger, the mortality being less than 5% when performed for stone. When done for suppurative disease, the mortality increases. The writer tabulated records of 78 nephrotomies for pyonephrosis, exclusive of tuberculosis, with a mortality of 21.8%; and reported 37 primary nephrectomies with a mortality of 24.3% and 17 secondary nephrectomies with a mortality of 58.8%. The following advantages of nephrotomy for pyonephrosis are claimed: It is easily tolerated by the patient; it permits the surgeon to determine the condition of the opposite kidney; it is conservative, and shows a balance in favor of recovery because it spares a portion of functioning kidney structure; it is indicated in pyonephrosis, when the condition of the other kidney can not be determined, when the patient's condition does not permit the performance of the major operation, when operation reveals the presence of considerable kidney tissue with an approach to the normal on the part of the renal pelvis and proximal portion of the ureter, and when there is evidence of disease in the other kidney. Primary nephrectomy is indicated when there is a sound second kidney, when exposure of the kidney shows it to be filled with pouches which can not be drained, when there remains but little kidney tissue, when an examination of the pelvis and proximal portion of the ureter shows that recovery is hopeless, and in paranephritic and perinephritic suppurations when the kidney acts as an impediment to drainage.

Bazy² describes his operation for **nephropexy**, called "nephropexie au hamac," which he has practised with excellent results. Through the usual lumbar incision the bare posterior surface of the kidney is exposed, and 3 catgut sutures are passed transversely under its fibrous capsule at a distance of about $\frac{3}{4}$ of an inch from one another. The ends of the first suture, about 1 inch apart, are passed through the eleventh intercostal space. The ends of the lower suture are passed through the muscle close under the twelfth rib. Now all 3 are tied. A catgut suture is then passed through the muscles under the twelfth rib and into the cellulo-adipose tissue, which is drawn up and passed by a series of sutures under the kidney. It is then passed through the muscles and its ends are tied. The kidney is thus supported below by a kind of hammock of fat. The muscles and skin are closed.

Hubbard³ reports 5 cases of **nephralgia** which resembled calculous disease, pain being the most pronounced symptom. All the cases were operated on, and in all but one a nephrotomy was done and stone was searched for. Four cases recovered from the pain and other symptoms. The one not relieved had the kidney incised also. The differential diagnosis between this condition and renal calculus is difficult, and is seldom made. The urine gives the greatest help, being normal in the majority

¹ Phila. Med. Jour., Aug. 26, 1899.

² Bull. et Mém. de la Soc. de Chir., Oct. 31, 1899.

³ Ann. of Surg., Aug., 1899.

of cases of nephralgia. The diagnosis from tubercular kidney may be difficult. Operation is usually performed with the object of finding a stone. Thorough exploration of kidney and ureter should be done. If a stone is not found, any mobility of the kidney calls for fixation by sutures.

L. L. McArthur¹ advocates a new operation for movable kidney. A transverse incision below the last rib is made down to the peritoneum, which is stripped up to the middle line behind. An incision is then made in the anterior layer of the lumbar fascia, which, together with the transversalis fascia, is stripped off from the muscles outside until a pocket is formed. The kidney, denuded of its fatty capsule, is dislocated upward and the lower end is slipped into the pocket made, where it is fixed, and is supported, external to one layer of the abdominal parietes, by the closure of the edges of the lumbar fascia and aponeuroses. Pressure from above only tends to drive the kidney deeper into the pocket.

Lejars² reports 4 cases of **anterenal abscess** in which the symptoms were indefinite. In the first a diagnosis of perinephritic abscess was made. The lumbar incision exposed the kidney, but no pus was found. By careful dissection over the external aspect of the kidney the abscess was reached. In 2 other cases a laparotomy incision disclosed the abscess anterior to the kidney, and in 1 case the mesocolon contained a quantity of seropurulent fluid which communicated with the abscess. One of the cases is supposed to have had its origin from an appendicial abscess. The other was mistaken for a neoplasm. This condition is rare, and is worthy of study and consideration.

M. Schlifka³ describes a new instrument for catheterization of the ureters. It is of the usual caliber with a slightly curved beak in which is situated a small electric light with a prism above. On the curved side is a tube admitting a small catheter, which is carried in front of the prism, and in this way may be engaged in the opening of the ureter by direct manipulation.

Carl Beck⁴ reports a case of **implantation of both ureters into the sigmoid flexure**. The patient, a man, suffered from tuberculosis of the bladder, which did not improve under ordinary treatment. The ureters were cut off an inch from the bladder and the latter was excised. A flap was made in the gut consisting of all its layers except the mucosa and submucosa, through which structures a small hole was made, and the ends of the ureters were carried through, about $1\frac{1}{2}$ inches being left free in the lumen of the gut. Around the flap they were sutured in a sort of groove in the bowel wall; the peritoneum below was sutured for a short distance. The writer attributes the success of the operation to the fact that the ends of the ureter were left floating in the bowel, thus lessening the danger of pyelonephritis. This is his own modification. A good recovery followed, and 5 weeks after operation the patient was able to hold his urine for 4 hours.

¹ Boston M. and S. Jour., vol. CXXI, No. 1.

² Rev. de chir., Nov., 1899.

³ Wien. klin. Woch., Jan. 4, 1900.

⁴ Chicago Med. Recorder, Nov., 1899.

Mayo Robson¹ reports 2 cases of successful **removal of a tumor of the suprarenal capsule**. In the first case death occurred from recurrence of sarcoma in a few months. The second, operated on in 1897, is still living. The tumor belonged to the struma lipomatosa suprarenalis. In the first case, on account of close association of the tumor with the kidney, it was necessary to remove the latter. In the second case only a wedge-shaped piece was removed. Robson publishes a table of 8 cases, supposed to cover all the instances of operation on the suprarenal gland. It shows 4 deaths and 4 recoveries. The following symptoms are given: Pain in the shoulder tip, believed to be due to involvement of small branches of the phrenic nerve; pain radiating from the tumor across the abdomen and back; marked loss of flesh and strength, with nervous depression and digestive disturbances. The tumor is felt below the costal margin, and is at first movable; later it becomes fixed. It can also be felt in the costovertebral angle posteriorly, and can be pushed into the hollow of the palpating hand in front of the abdomen.

At a meeting of the Johns Hopkins Hospital Medical Society on Jan. 8, 1900, H. A. Kelly reported a case of **renal calculus**, with special reference to diagnosis and operation. The patient was admitted to the hospital with the diagnosis of suspected tubercular kidney. This was not confirmed after careful examination. A fine renal catheter was passed into the left kidney; 12 cc. of fluid were then injected into the kidney, producing at once an attack of renal colic such as the patient had been suffering from. On withdrawal of the catheter a magnifying glass showed on the waxed end a number of small scratches, rendering the diagnosis of renal calculus positive. Operation was performed and a small stone blocking the ureter was removed. In the operation an incision was made laterally from a point 2 or 3 inches in front of the quadratus and down to the pelvic brim. The renal space posterior to the peritoneum was exposed by separating the muscles, which after operation fall together and are secured by 2 or 3 tiers of catgut sutures. Kelly states that this is the revival of an old operation which has been overlooked in recent years.

T. J. Maclagen and Frederick Treves² report 3 cases in which a **movable kidney produced symptoms like those of gall-stone**. There was pain in the right hypochondriac region, with recurring attacks of jaundice, and colic resembling gall-stone colic. In 2 cases the jaundice was due to the pressure of the misplaced kidney on the cystic duct; and in the other, which presented the most marked symptoms, to pressure on the common duct.

Albaran³ reports a case of **tuberculous kidney diagnosed by catheterization of the ureters**. A man aged 34, with no tubercular history, began 4 months before the operation to suffer from frequent micturition, with dysuria and pyuria. There was tenderness of the bladder, which held only 120 gm. of liquid. The urine contained the

¹ Brit. Med. Jour., Oct. 21, 1899.

² Lancet, Jan. 6, 1900.

³ Bull. et Mém. de la Soc. de Chir. de Par., Oct. 11, 1899.

bacillus of Koch with pus and shreds of membrane. The testicles and prostate were healthy, but the ureters and kidneys were not tender. The cystoscope showed cystitis with a villous appearance around the orifice of the left ureter. By catheterization the urine from the left ureter was found to be purulent, containing diplococci, colon bacilli, and, it was believed, tubercle bacilli. The urine was albuminous, of low specific gravity, and contained little urea. The urine from the right ureter was normal except that its specific gravity was low. The left kidney, together with $4\frac{3}{4}$ inches of the ureter, was removed. A tubercular mass the size of a chestnut was found in the upper portion of the kidney. Twenty-four hours after operation the urine was perfectly clear. This case illustrates the diagnostic value of catheterization of the ureters.

Beuckisu¹ refers to the surgery of abnormal ureters, and cites 2 cases. The first, a female who had suffered from incontinence since youth, was found to have a ureter opening a little externally and posteriorly to the meatus. Thorough investigation being refused, it was impossible to determine whether the ureter was supernumerary or normal with an abnormal opening. The orifice was closed by introducing 3 sutures, and no dribbling occurred for 5 days, nor was there evidence of retention in the ureter. The orifice was then partly excised and partly closed with sutures. After a time incontinence returned, with the ureter opening into the upper part of the vagina. The second patient, a woman, suffered from incontinence of urine from an orifice just behind the meatus. A fine sound could be introduced and passed up in front of the vaginal wall. Closure of the orifice was unsuccessful, as retention in the ureter followed. The orifice was excised, and the posterior wall of the ureter was split up nearly to the cervix. A catheter was introduced into the bladder, its point exposed by an incision through the anterior vaginal wall, and the vesical mucosa sutured to the edges of this wound, which was finally closed. On the ninth day a fistula developed, which was closed a month later. Two years afterward the patient was free from urinary trouble.

Calculus in the ureter is the subject of a paper by Henry Morris.² As regards etiology, he says that stones in the ureter descend from the kidney and become impacted on account of their large size or irregular shape. Should the irritation caused by their presence lead to thickening, rigidity, or stenosis, the stone will remain in place permanently. Calculi that form primarily in the ureter are rare. A calculus may remain impacted permanently or for a variable time. In the majority of cases the point of impaction is about 2 inches from the kidney. The next situation where impaction is most frequent is just before or where the ureter passes through the vesical wall. These calculi differ in form, size, and composition. The diagnosis of ureteral calculus is extremely difficult, and unless the stone can be felt through the abdominal parietes, the rectum, the vagina, or the bladder, its location can not be determined except by exploratory operation; and only in this way can a

¹ Zeit. f. Geburtsh. u. Gynäk., vol. XII, part 3, 1899.

² Lancet, Dec. 16, 1899.

stone situated high up be differentiated from a renal calculus. If it is situated in the lower portion of the ureter, catheterization from below may locate it, though it may be mistaken for a stricture. It may be impossible to differentiate between a stone encysted in the ureter just above the bladder opening and one encysted in a sac formed by a pouch of the ureter and between the coats of the bladder, especially if the ureteral orifice is closed. A differential diagnosis must be made from cystitis, ureteritis, early vesical tuberculosis, and prolapsed and adherent ovary. The symptoms are almost the same as those of renal calculus. In thin persons a stone may sometimes be felt through the abdominal wall. If it is situated within $2\frac{1}{2}$ inches of the bladder, it can be felt through the vaginal roof. If pain, hematuria, and other symptoms of stone extend over days, weeks, or months, the passage of a ureteral calculus should be suspected. The same thought should be entertained if after one or more attacks of renal colic a patient is seized after walking or exertion with pain shooting along the ureter and settling at one point in its course. The pain, hematuria, and subsequent effect on the kidney depend on the shape of the stone perhaps more than on its size. If impaction occurs and there is only one kidney, or both have only one ureter, then anuria results. An intermittent abdominal tumor may occur, as may also a persistent tumor. The urine may contain crystals, fragments of calculi, fibrous coagula, blood-casts of the ureter, and pus. The prognosis as regards the kidney is unfavorable. If the obstruction is complete, the kidney may become converted into a small fibrous mass or sac. If it is not complete, dilation, with destruction of renal tissue, is an early or a late result in most cases; and in infective disease of the lower urinary tract suppurative nephritis occurs. As regards life, the prognosis depends on the condition of the other kidney. If it is normal, the chances of prolonged life are excellent. If it is diseased, the prognosis is grave. The pathologic effects on the ureter, kidney, and peri-ureteral tissues are mentioned. Above the obstruction the ureter may become thinned out by excentric pressure and stretching, it may become edematous, ulcerated, and inflamed, or it may be dilated, sacculated, and tortuous. The dilated portion may rupture. Stricture may follow ulceration at the point of impaction. The portion of ureter below the obstruction may be little changed or it may be thickened, stenosed, and converted into a fibrous band. The kidney may undergo chronic changes. Its calyces and pelvis may be dilated. It may be rendered anemic and converted into a mass of shriveled fibrous tissue; or it may be entirely destroyed. It may be converted into one or more pouches containing pus, from which a fistula may communicate with the loin. The periureteral tissues may become the seat of inflammation and abscess. *Treatment:* As soon as the diagnosis is clear the ureter should be explored and the calculus removed. The extraperitoneal route is recommended. The stone should be displaced upward in the ureter and removed through an opening a little way from the point at which it was lodged, as here the wound would not heal so readily. When the ureter is blocked near

its upper end, the stone, if smooth and easily moved, should be pushed upward into the renal pelvis and thus extracted. If the calculus is situated in the vesical end of the ureter, and is projecting into the bladder, it may be removed through the urethra. Should there be found a stenosis or stricture of the ureter as well as a calculus, it ought to be treated after the stone is removed. The writer described his method of treatment of stricture or stenosis of the ureter in the *Lancet*, July 1, 1899. [The x-rays, when used by an expert, are of the greatest value in making a diagnosis of stone in the ureter.]

Henry Morris¹ discusses **primary tumors of the suprarenal gland and their removal by operation.** These tumors are considered first from the standpoint of pathology. It is difficult to distinguish them from certain kidney tumors. They may be (1) simple glandular enlargements; (2) large adenomas; (3) malignant growths. The origin of perinephritic tumors other than those mentioned is in adrenal "rests," found in the perinephritic tissues or in the hilum of the kidney. The nature of some primary kidney tumors is similar to the normal adrenal tissue, and in others some portions resemble suprarenal tissue. Other parts resemble alveolar sarcoma, and some carcinoma. The following symptoms are referred to: (1) An increasing loss of strength, with languor and debility. (2) Emaciation, varying in degree. (3) Gastro-intestinal disturbance, such as nausea, vomiting, anorexia, constipation, or diarrhea. (4) Pain, referred to different parts of the body, as the renal region, the epigastrium, or the hypochondriac regions, or to the knee-joint or ankle-joint. It is usually intermittent. (5) The circulatory system is rarely involved. Cardiac palpitation, anemia, and edema of the legs may exist. (6) Skin changes are not marked. There may occur some bronzing, or a change in the color or texture of the skin, described as a "brownish discoloration," "muddy looking," or "a yellowish color." (7) Hematuria may occur, and is apt to, if the kidney is involved. (8) An abdominal tumor may or may not be noticed. (9) There may be no symptoms referable to the suprarenal capsule; symptoms referable to the respiratory tract may be pronounced. As a rule, there are no urinary symptoms unless the kidney is invaded. There may be marked displacement of the kidney by the tumor. The tumor may be extremely mobile, much more so than a movable kidney. Rapidity of growth, with a tendency to metastasis, is a point of distinction between suprarenal and renal tumors. Malignant tumors of the suprarenal gland occur most frequently in infancy and childhood. They have a tendency to invade the chest. The following symptoms are given: (1) A tumor in the renal or suprarenal region which is unusually mobile and has grown rapidly, with secondary growths in the skin, liver, or temporal region; (2) loss of strength, with marked emaciation; (3) absence of any change in the urine or temperature; (4) the presence of pigmentation of the skin or of rapid growth of hair over the body; (5) gastro-intestinal disturbance; (6) pain, deep-seated abdominal, or ill defined in some joint or distant part. The difficulty in diagnosis arises from the asso-

¹ Brit. Med. Jour., Nov. 11, 1899.

ciation of the growths with the kidney. The prognosis is very unfavorable, owing to the rapidity of growth, the tendency to metastasis, and the frequency with which both glands are involved. The treatment is early and complete removal. Unless complete removal can be effected, it should not be attempted. If metastasis has occurred, operation may be done only to relieve suffering. In operating, if the tumor is large and freely movable, the transperitoneal route answers best; if the tumor is small and situated well back in the loin, the lumbar incision is best. In some cases the methods must be combined. It is sometimes necessary to perform a nephrectomy when removing the tumor.

Christian Fenger¹ criticizes an article by George M. Edebohls² on **the other kidney in contemplated nephrectomy**. The latter claims priority in the use of an exploratory lumbar incision for the purpose of determining the condition of the fellow of the kidney to be removed. Edebohls employed this method in an operation in 1894, and reported the case in the *American Journal of Obstetrics*, Feb., 1895. Fenger used the method in 1890, and reported the case before the Chicago Medical Society, Feb. 6, 1893. It was published in the *Chicago Medical Record*, March, 1895. Reference is made to a case reported in a Danish journal by Rosving in which the same method was employed.

A. E. Halstead³ discusses **movable kidney**. He first gives in detail the topographic anatomy of the kidney and describes its fixation apparatus, which consists of the peritoneal ligaments, abdominal wall, abdominal viscera, renal vessels, and general intra-abdominal pressure, combined with the shape and depth of the paravertebral fossæ, in which the kidneys normally rest. The last-named is considered the most important factor. The etiology is next discussed. Several causes, such as a general enteroptosis, absorption of the perirenal fat, and trauma, are referred to. What is considered the most important factor, however, is a malformation, either congenital or acquired, of the paravertebral fossæ. Symptoms are next referred to. Those referable to the nervous system are regarded as most important, as pain located in the lumbar portion of the spinal column and radiating along the branches of the lumbar and sacral plexus—intercostal neuralgia. Menstruation in some cases aggravates the symptoms of movable kidney. This has led to treatment of the pelvic organs. Gastric disturbance is a common symptom. This is explained by the intimate relation which exists between the nerve supply of the kidneys and the gastro-intestinal tract. The urine does not usually show anything abnormal. In some cases violent exercise or heavy lifting brings on an attack of severe abdominal pain and vomiting, as in strangulated internal hernia. This is supposed to be due to the kidney becoming fastened in the retroperitoneal tissue. The surgical treatment is next discussed. Rest and the application of abdominal supports and pads are considered only palliative, and never curative. The operation of extraperitoneal nephrorrhaphy is recommended. The following method, for which the best results are claimed, is given: The kidney is

¹ Ann. of Surg., Sept., 1899.

² Ann. of Surg., April, 1899.

³ Medicine, Sept., 1899.

exposed through the lumbar incision, the fatty capsule is opened and pulled out of the wound, and the superfluous tissue is removed. The fibrous capsule is then split along the convex border of the kidney and its edges are stripped back. Catgut sutures are then passed through the fibrous and fatty capsules and the anterior layer of the lumbar fascia. Strips of gauze are then packed around and below the lower pole of the kidney as a support. The wound is closed except at the lower end, where the gauze, which remains for 5 or 6 days, is brought out. The patient should be kept in bed for 6 weeks.

Dudley Allan and C. E. Briggs¹ report a case of **end-to-end anastomosis of the ureter**. The severed ends were approximated and sutured with very fine catgut. To prevent infection of the peritoneal cavity from leakage it was shut off by a flap from the anterior pelvic wall, drawn upward and backward, and sutured to the pelvic brim. Iodoform gauze was carried through the vagina and out the lumbar opening. The case being one of horseshoe kidney, successful demonstration was rendered impossible, as there might have been but one pelvis to the kidney, all the urine passing through the undivided ureter; or the lumen of the ureter might have been obliterated by cicatrization and the portion of the kidney which it drained might have undergone atrophy, its function being performed by the portion of kidney drained by the right ureter. The case, however, was considered successful.

Achille Boari² describes **an operation for implantation of the ureter into the bladder**, and gives some indications for its performance. It is indicated in cases of ureterovaginal and uretero-uterine fistulæ, and of fistulæ of the lower end of the ureter in general, provided the ureter is long enough to be implanted into the bladder. Abnormal positions of the ureteral opening may be thus remedied. It may be employed when removing vesical tumors involving the ureteral orifice. Stenosis of, or encysted calculus in, the lower end of the ureter may furnish an indication for the performance of this operation. In the operation described the Boari anastomosis button is made use of. Its small size permits of its removal through the female urethra; in the male, cystotomy would be necessary for its removal. The technic of the operation is described in detail. Implantation of the ureter into the bladder is not followed by disturbance of urinary secretion, and is devoid of the dangers of infection and cicatricial contraction attending implantation into the rectum. In the case mentioned there was some renal dilation, attributed to a backward flow of urine into the ureter from overdistention of the bladder. This may be overcome by making the implantation oblique or into the summit of the bladder.

DISEASES OF THE PENIS, URETHRA, TESTICLE, ETC.

In a paper on **double castration for tuberculosis of the testes**, F. A. Southam,³ referring to the paucity of authority for the removal

¹ Boston M. and S. Jour., Oct. 7, 1899.

² Ann. d. mal. d. org. genito-urin., Nov., 1899.

³ Brit. Med. Jour., April 21, 1900.

of both glands in this condition, reports 4 cases in which he has performed this operation with entire absence of those mental and physical symptoms which Watson Cheyne, in his *Harveian Lectures on The Surgical Treatment of Tuberculosis*, had pointed out as a result of double castration. The cases have been under observation for some time, one case since October, 1898, which was the date of removal of the second testicle. The author reports one case of epididymectomy in which he removed the epididymis, together with $4\frac{1}{2}$ inches of the vas, with good results thus far.

James R. Wallace,¹ of Calcutta, writes about the **radical cure of hydrocele** by evacuation of the fluid contents and the injection of strong iodine solution. The author states that hydrocele is endemic in Lower Bengal, at least 25 % of the natives suffering from this condition; consequently he has had a very large experience, and considers the injection method "an absolutely safe" and "infallible cure for this malady." After the cannula is introduced every drop of serum is allowed to ooze out; and when this is accomplished, a syringe is attached to the cannula and 1 or 2 drams of the Edinburgh tincture or the London liniment of iodine are injected. Severe pain follows the injection, but this soon passes away. No local applications are made to check the inflammatory process, which ultimately agglutinates the sides of the tunica and prevents recurrence.

J. G. Mumford,² in an article on **the high operation for disease within the scrotum**, calls attention to the difficulty of procuring asepsis in operations in this region, and, following a suggestion of Cushing's, has adopted a method which consists in making an incision in the groin similar to that made for the Alexander operation for shortening the round ligament. The scrotal contents may be withdrawn easily, even though consisting of tumors of considerable size, and resection of the tunic or orchidectomy may readily be done. The author has performed the radical cure for hydrocele by the high incision, first withdrawing the fluid contents and then inverting the scrotum, etc., and is very favorably impressed with the general advantages of this method.

In a discussion upon the **treatment of varicocele** Armequin,³ from the point of view of a military surgeon, asserted that this condition does not indicate operative interference unless pain and discomfort or interference with military duties is complained of. When the use of a suspensory bandage fails to arrest the swelling, then it is necessary to operate. The writer advises bilateral resection of the scrotal walls, affording permanent suspension of the testes, and obviating risk of inflammatory involvement of other structures. Resection of the veins is done in case there is relapse after the former operation, or in case there are pathologic changes in the vein-walls. [A number of years ago the late R. J. Levis operated upon many cases of varicocele by simply shortening the scrotum. Many of these operations were performed in the hospital of the Jefferson Medical College. Practically all the cases relapsed.

¹ Dublin J. M. Sci., Mar., 1900.

² Boston M. and S. Jour., Jan. 25, 1900.

³ Arch. de Méd. et de Phar. Milit., Sept., 1899.

We have no confidence in the operation as a cure for varicocele, though we believe it is sometimes advantageous to combine it with ligation of the veins if the scrotum is redundant or if there are varices of the scrotum.]

In a discussion at the Société de Chirurgie, Reynier¹ reported a case in which he had removed the testicle and vas 5 cm. from its termination for **tuberculous disease of the testicle**. He stated that it is easy to follow the vas by distending the bladder and using the Trendelenburg position, and that removal of the seminal vesicles may be done by a sub-peritoneal route. Villeneuve² reported a case of removal of a vesicle from the front, but, as Reynier remarked, the conditions must have been exceptionally favorable. In further discussing tuberculous disease of the testicle Reynier claimed that this affection is much more serious than is generally admitted, and contended that total castration is the only safe method of treatment. Berger³ claimed that castration is necessary in two conditions of tuberculosis of the testes: namely, in the early stage, to remove an isolated focus, and when suppuration exists, although in the latter case operation is only palliative, as the vesicles are nearly certain to be involved. Recurrence, he states, is common, either in the other testicle or locally. He is opposed to bilateral castration, but says that excision of the vas should always be complete in the unilateral form of the disease. Conservative measures were advocated by Quénu and Lucas-Championnière⁴ on the ground that if this is done, the physiologic function is retained in part at least.

J. Henry Dowd,⁵ at the thirty-second annual meeting of the Medical Association of Central New York, at Syracuse, Oct. 17, 1899, reported a **case of spermatocele**. The fluid contained in the sac at the time of operation was examined and was found to confirm the diagnosis. The author calls attention to the necessity for operation, owing to the liability of rapid growth with consequent testicular atrophy. He advises careful dissection of the tumor rather than the open method of Volkmann, for after Volkmann's operation subsequent scar tissue and probable testicular adhesion may cause neuralgia of the testicle.

The **treatment of tuberculous testicles** is discussed by Potherat,⁶ who states that in every case in which removal of one testicle was performed, the other became involved in less than 2 years, the general health remaining good. The author concludes, therefore, that positive cure of genital tuberculosis can be accomplished only by bilateral removal of testicles, vas, and prostate.

F. R. Sturgis⁷ reports a case of **teratoma testis** which presents some unusual features. With the exception of epithelioma two generations back, there was no family or personal history bearing on the case. Before operation the diseased testicle was enlarged, hard, and smooth, there was no fluctuation or pain, but the increased weight produced dis-

¹ Rev. de chir., Feb. and May, 1899.

² Rev. méd. de la Suisse Rom., April 20, 1899.

³ Gaz. des Hôp., May 11, 1899.

⁴ Gaz. méd. Belge, Nov. 30, 1899.

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⁵ Rev. de chir., May, 1899.

⁶ Brooklyn Med. Jour., Dec., 1899.

⁷ Am. Med. Quarterly, Sept., 1899.

comfort. There was no involvement of the cord or glands. Strapping and the administration of iodid of potash produced no benefit, the growth having increased 3 cm. in a month. After operation a pathologic examination showed lobulation, with cysts containing cheesy matter, and areas which resembled sarcoma, granular tubes, adenocarcinoma, etc. Three months after operation enlarged inguinal glands, with abdominal pain, and edema of the left leg suggested the presence of an abdominal growth, of which the testicular growth was a metastasis.

John B. Roberts¹ reports a case of **successful suture of the vas deferens**, which he had divided in an operation for hernia. The method used was similar to that employed in repair of the ureter, a split being made in the lower end and the two parts then being held in position by sutures; one year later there was no atrophy of the testicle, which seemed to be physiologically normal. [It seems improbable that the lumen of so small a tube should remain unblocked after suturing. If such an accident happens, suturing should be employed in the hope of success, but the hope is very slender. Ingianni and Arpini, in 1898, made a series of experiments which indicated that after suturing a space forms because of muscular contraction, which space fills with cicatricial tissue sufficient in amount to occlude the lumen. It is not certain that atrophic changes did not exist in the testicle of Roberts' patient simply because the gland seemed to be normal.]

A case presenting a **novel method in urethrotomy for stricture** is reported by Mark Wardle.² After anesthetization a No. 4 elastic catheter was passed through the first stricture, and presumably as far as the next; but efforts to locate the tip having failed, the operator cut down where he thought the second stricture was, and was able from this point to pass a director into the bladder. It was then found that the catheter was in a false passage. A No. 9 elastic catheter was then passed from the wound into the bladder and the wall of the false passage was divided, thus liberating the point of the No. 4 catheter. The bone head of the large catheter was now removed, and, using the small catheter as a guide, the large one was slipped over it and passed out through the first stricture. The wound was sutured and the patient made a good recovery.

A case of **resection and suture for impermeable stricture of the urethra** is reported by Deanesly.³ The urethra having been opened, it was found impossible to pass the finest instrument, therefore the contracted part was carefully dissected away and, a catheter being left in position, the healthy parts were sutured with 6 silkworm-gut sutures, passed through all the coats of the urethra. The urine was drained and the wound was kept dry for 10 days, when the catheter was withdrawn. One year later there was no contraction, although a sinus, due apparently to a stitch, still persisted. There was no leakage of urine, although the site of operation was the anterior part of the bulbous urethra.

It is claimed by Gerald Dalton⁴ that **beta-eucain in surgery of**

¹ Phila. Med. Jour., Dec. 30, 1899.

² Edinb. Med. Jour., Oct., 1899.

³ Brit. Med. Jour., July 29, 1899.

⁴ Therapist, Dec. 15, 1899.

the urethra is equal to cocain as a local anesthetic, and is much less toxic. A 3% solution retained from 5 to 10 minutes will readily anesthetize the anterior urethra. If deeper parts of the urethra or neck of the bladder are to be rendered anesthetic, the fluid should be introduced by means of a prostatic syringe. The anesthetic condition remains for from 5 to 20 minutes.

J. A. Moore ¹ reports the use of **suprarenal extract** over 200 times in operations on the urethra. In a discussion before the New York County Medical Society he stated that he used a 10% solution, and gave it either hypodermically or by injection. His results show that very slight irritation or bleeding follows instrumentation, if this preparation has been previously used. The effect is transitory, and if necessary the injection may be repeated. He reports 2 cases of acute gonorrhea in which the injection of the suprarenal extract gave complete relief from pain in micturition.

Gouley ² asserts that catheters are much injured by fats, vaselin, or glycerin, and that soap free from glycerin and free alkali should be used. He recommends the following as the best **lubricant for catheters**:

R. Powd. white castile soap	℥j
Water	℥ij
Mucilage of chondrus crispus	℥ij
Formalin (40%)	℥x
Thymol	gr. v
Oil of thyme	℥v
Alcohol	℥xv.

Heat the soap and water, and stir until a smooth slime is formed; add the mucilage (1 ounce of chondrus crispus to 1 pint of water); when cool, pour in the formalin, then the thymol and oil of thyme mixed with the alcohol; stir, strain, and keep in a covered vessel until all bubbles have left. Keep in 2-ounce collapsible tubes.

M. Larroudé ³ considers that **linear electrolysis in strictures of the urethra** presents certain advantages. This method is applicable to nearly all kinds of strictures, is easy, and causes only slight pain. There is little bleeding, and fever seldom follows. Urination may be accomplished at once with a full stream, hence there is no need for a retained catheter and the patient may resume his work the following day.

Gerald Dalton ⁴ describes an **apparatus for sterilizing urethral instruments**. A metal box 18 inches long, 4 inches wide, and 4 inches deep has two sliding open-wire trays, on which the instruments are laid; a third tray, which is just clear of the floor of the box, has a piece of lint spread on it, upon which is sprinkled powdered paraform or trioxymethylene, which slowly gives off vapor, sterilizing thoroughly in 24 hours the instruments above (Guyon). Instruments may be left in the box indefinitely. Before using, the instruments should be placed in boric acid solution to remove any adherent paraform. Before placing instruments in the box they should be thoroughly washed in soap and water and dried, and the box kept at a temperature above 56° F.

¹ Med. News, Mar. 24, 1900.

² N. Y. Med. Jour., Nov. 4, 1899.

³ Gaz. hebdom. de méd. et de chir., Sept. 17, 1899.

⁴ Lancet, Feb. 18, 1899.

The formation of a **permanent fistula in the perineal urethra** is recommended by Poncet¹ in cases in which a part of the urethra has been hopelessly destroyed by traumatism or an inflammatory process. The writer has performed this operation 23 times, with good results. An ordinary external urethrotomy is first done, the proximal end of the exposed urethra is stitched to the proximal part of the perineal wound, and the distal part of the urethra is closed. Patients on whom this operation has been done, say that there is no incontinence and but little inconvenience.

Campbell Clark and Henry E. Clark² report a case of **resection of the afferent nerve** of the reflex circuit of the penis as treatment for **persistent masturbation** when it was a symptom of deep-seated nervous disease. The operation is performed as follows: A transverse incision is made $\frac{1}{2}$ of an inch from the root of the penis on the dorsal aspect. The dorsal vein is avoided, and the nerves, which are two in number, are sought for in the loose superficial fascia on the lateral margins of the dorsum, in close relation to the dorsal arteries. Usually they are found to the outer side of the arteries. After isolation of the nerves is effected, about $\frac{1}{2}$ of an inch of each nerve is resected. The case reported was a man of middle age who had been insane for 3 years. The result was entirely satisfactory, the habit having been discontinued for over a year, with marked mental improvement. The authors suggest that in the incorrigibly vicious or the insane this procedure has its advantages.

At the meeting of the British Medical Association, Aug. 1-4, 1899, James H. Nicoll³ read a paper on the **treatment of urethral stricture** in which he stated his belief in the entire curability of stricture. His method consists in rapid dilation up to No. 20 English with a special instrument. This instrument is somewhat constricted just behind the curve or shoulder, and rapidly becomes bulbous. It tapers toward the handle. The advantages of this instrument are its freedom from the grasp of the meatus and the ease with which it enters into a tight stricture. In cases requiring perineal drainage the author uses a drainage-tube having a socket-joint, presenting the advantages of ease of sterilization and of ready access to the bladder for douching or removing plugs or clots. In a series of experiments conducted by the writer he shows that sterilizing soft bougies by washing with soap and water and drying with a sterile towel is effectual. Soft catheters may be boiled as are metal instruments, but no method is safe that is not destructive of these instruments. The writer thinks that every urethra requiring instrumentation abounds in germs, and that it is doubtful if we possess any certain method of differentiating gonococci from diplococci found in the normal urethra.

In a lecture by A. Marmaduke Sheild⁴ on **cancer of the penis** the author considers local irritation accompanying phimosis the principal cause of this disease. The disease is usually one of advanced life, although a case is recorded the victim being only 22. In the early or

¹ Lyon méd., No. 53, 1899.

³ Brit. Med. Jour., Oct. 21, 1899.

² Lancet, Sept. 23, 1899.

⁴ Lancet, Jan. 13, 1900.

so-called "precancerous stage" the application of caustics is condemned; the proper treatment being early circumcision, and soothing local remedies until the diagnosis is made, when amputation should be performed at once. The author calls attention to the formation of horny growths, which usually have epitheliomatous bases, and the presence of psorospermiosis (Paget's disease) in the early stages of penile cancer. This malignant dermatitis should never be mistaken; it is vivid red in color, with a raw, glazed appearance, has whitish islets of epithelium scattered upon it, and there is a viscid alkaline discharge. If the base is grasped by the fingers, induration may be felt. Two forms of cancer of the penis are distinct—the warty or papillary and the excavated ulcerating. The error of diagnosis between a hard chancre and cancer is cleared up by waiting for the "rash" or by microscopic examination of an excised portion. In operating the author employs the lateral flap method, brings out a portion of the urethra, and stitches it to the sides, after splitting. In complete amputation the urethra is brought through an opening in the perineum. The inguinal glands are removed in most cases, although if suppuration is present from double infection the inguinal wound does not heal easily. Six cases are reported, with good results in all. In conclusion, the author urges early operation as soon as diagnosis is made.

DISEASES OF THE BLADDER AND PROSTATE.

A. T. Cabot¹ relates his personal experience in **operations for stone in the bladder**, and states that statistics are often misleading, because cases will develop conditions even years later which bear on the value of any particular operation. Cases of impotence following an incision for stone in childhood sometimes are not found until many years after puberty. Carcinoma of the bladder and narrowing of the urethra have been noted after a perineal lithotomy. In an analysis of the writer's cases the mortality was 4%, not including one death from tuberculosis; and in each fatal case the death was due rather to an aggravation of existing conditions than to the operation itself. The operator therefore concludes that "litholapaxy on a tolerably healthy subject has practically no risk." As to whether any other operation gave a better chance in the fatal cases, the author thinks that when there is a serious bronchitis, a suprapubic lithotomy under cocain is indicated. Only one accident—viz., rupture of the bladder—was met, but this was a case of a very irritable bladder, which condition was recognized before, and continued after, the operation. With regard to recurrence, the writer thinks that it is largely due to alkalinity of urine or that it results from the formation of granulations, which tend to "molecular coalescence" and subsequent stone formation. The writer thinks that litholapaxy should be done except when a very large and hard stone exists or when its nucleus can not be crushed or is too large to pass through the urethra, or when the stone is encysted; when false passages are present, when ankylosis of the hip

¹ Johns Hopkins Hosp. Bull., May, 1900.

exists, when there is an immovable stone in the prostatic urethra, when there is constant recurrence from an ulcerated area, or when obstruction from the prostate to instrumentation occurs.

Ramon Guiteras¹ reports 12 cases of prostatic hypertrophy benefited by the **Bottini operation**. He says that cases showing frequency of urination, with increasing amounts of residual urine, troublesome cystitis, or retention associated with catheter life call for operation, except when the kidneys are in bad condition. Care should be taken in these cases not to empty the bladder too quickly, as an attack of uremia may be induced. The writer does not use a cystoscope immediately before operation, but it should be used at the time of examination, if at all. The use of a finger in the rectum the author condemns, as a rectovesical fistula might be made in this way. Three cuts are usually made, a posterior and two laterals, although this is varied with the case; the length of the incision also varies with the case from 2.5 cm. to 4 cm. It is important while making the cut to keep the handle of the instrument slightly raised, so as to cut through the base of the prostatic collar. The improvement caused by the Bottini operation is produced by lowering the height of the obstructing dam, severing the blood-vessels supplying the gland, and producing atrophy. The author concludes that the results in the foregoing cases lead him to decide that the Bottini is the operation which produces the best results with the least danger. Willy Meyer² reports 12 additional cases of Bottini's operation for prostatic hypertrophy, making 24 cases, on which this operation was performed 30 times, some of the cases undergoing more than one operation. The author's cases show 38 % of cures, 29 % much improved, 8 % improved, and a mortality of 8 % due directly to the operation and of 8 % indirectly due to operation. These percentages include the first 12 operated on, and include all the cases. The writer states that in some he would have declined operation, had it not been the only alternative, and that one fatality was due to the anterior incision, which he has now abandoned. He thinks that the future offers the hope of a further reduction in mortality.

Jacob Frank³ reports a series of experimental operations of **vesico-rectal anastomosis**. A previous series of implantations of the ureter in the rectum was followed in each case by infection of the kidney, which led the writer to try to combine the bladder and rectum into one receptacle, such as is found in some of the lower animals and in birds. The operation consists in anastomosis of the bladder and rectum by means of a Murphy button or decalcified bone coupler. The experiment has been done on 15 dogs, 10 of which recovered and 5 died, and the writer thinks that with perfected technic the failures can be obliterated. A great future for this operation is predicted in cases of exstrophy of the bladder. A bacteriologic and microscopic study of 5 of the experimental cases is furnished in the author's report, and in only 1 case was there any microscopic evidence of a change from the normal.

¹ N. Y. Med. Rec., July 29, 1899.

² N. Y. Med. Rec., May 12, 1900.

³ Chicago Med. Recorder, Dec., 1899.

W. Moore¹ reports a case of **removal of epithelioma of the bladder**, with recovery. An exploratory suprapubic cystotomy was first done, and a malignant growth, $1\frac{1}{2}$ inches in diameter, was found about $\frac{1}{2}$ of an inch from the slightly enlarged prostate gland. The growth was removed, including the attached peritoneum, and was closed in two layers, the first of catgut, through the muscular and submucous coats, and the second of silk, bringing the peritoneum together. The abdominal cavity was finally closed with through-all wire sutures and the bladder wall was drawn up to the parietes with silver wire. The bladder was drained suprapubically and recovery was excellent.

W. H. Battle² reports a case of **tuberculosis of the bladder** greatly improved by hydraulic distention. The patient, a man of 22, was admitted with tuberculosis of both testes, of the epididymis, and of the seminal vesicles, and complaining of frequent and very painful micturition for $3\frac{1}{2}$ years. Distention was practised by passing a catheter, and 4 ounces of water were first injected, the reservoir being held about 4 feet above the patient. This treatment was carried out daily, boric acid being substituted and the bladder filled to its greatest capacity. A month later retention was established for periods of $2\frac{1}{2}$ hours, and 5 or 6 ounces of solution could be injected. Treatment was finally given after 3 months only every fourth day, and at that time the patient passed urine only 4 times daily.

Fontan, of Toulon,³ reports a case of **penetrating stab wound of the bladder** through the sciatic notch, severing the gluteal artery—ligation, laparotomy, recovery. There was a history of stab wound in the thigh, and on examination symptoms of shock and hemorrhage were detected. Catheterization disclosed blood, and indicated a wound of the bladder. Laparotomy showed that the hemorrhage was extraperitoneal. A probe in the stab wound passed into the pelvis through the great sciatic notch and rested on the bladder posteriorly. A wound of the bladder was established by the fact that boric acid solution passed from the bladder through the pelvis. As it was impossible to locate the bladder wound, a strip of iodoform gauze was packed at the posterior surface of the bladder, and the end allowed to protrude from the lower part of the abdominal wound. The gluteal artery was ligated. The catheter was left in the bladder and recovery followed.

Malignant disease of the prostate is the subject of a monograph by Wolff⁴ in which he calls attention to the fact that in the aged it is often not suspected during life. Prostatic carcinoma frequently obstructs the rectum, although difficulty in micturition is common. Pain in the prostate is a common symptom, owing to obstruction of the glandular secretion. Bimanual abdominorectal examination under anesthesia shows a hard, minutely tubercous condition. An important fact in diagnosis is pain on catheterization; the prostatic urethral walls are hard, and intolerance to the passage of the catheter is soon established. Secondary involvement soon takes place in the bladder and seminal vesicles,

¹ Internat. Med. Jour. of Australasia, Mar. 20, 1900.

² Lancet, Dec. 9, 1899.

³ Rev. de chir., Dec. 10, 1899.

⁴ Deut. zeit. f. chir., vol. LIII, Sept., 1899.

and the entire bony skeleton may be involved. Few cases survive operation, although interference is the only chance of cure. **Sarcoma** of the prostate may occur, the growth being very rapid. Schalek¹ reports a case under the care of Bayer, of Prague. The patient, a boy of 3 years, was admitted for operation 6 weeks after a hypogastric growth was noticed. The growth filled the hypogastrium from both iliac fossæ to the umbilicus. The growth as well as the adherent bladder were removed, and the ureters were implanted into the rectum. The patient died 5 days later with acute bronchitis.

Laphorn Smith² reports a case of **tightening of the sphincter vesicæ** for urinary incontinence. The condition followed a severe instrumental delivery a year previously, and when examined there were found a cystocele, proctoceles, and lacerated perineum. The vesical sphincter was very much relaxed. Hegar's operation on the posterior vaginal wall was done, and after denuding the vaginal mucous membrane well down to the meatus, the sphincter was tightened by means of a running catgut suture, which was buried in the muscular layer of the bladder down to the urethra. Recovery was excellent.

In cases of **exstrophy of the bladder** Sonnenberg³ recommends removal of the entire bladder and the insertion of the ureters into the penis, and has performed the operation 7 times with no fatality. Plastic operations on the bladder-wall, although readily done, have many disadvantages, such as the collection of irritating crusts, etc., and the resulting pouch has only slight retaining power. If the ureters are transplanted into the bowel, there is always the menace of pyelonephritis. Maydl⁴ has endeavored to prevent this complication by forming a valve at the ureteral opening. In 5 cases in which this operation was performed, 4 recovered and 1 died; but of the next 5 cases, all recovered. Rutkowski,⁵ in a case of extroversion, formed the anterior wall of the bladder from part of the ileum. Complete removal of the bladder, with the formation of a new one from gut, had been done experimentally by Tizzoni and Poggi on animals. In Rutkowski's case the abdomen was opened by a median incision and about 6 cm. of the ileum were resected. End-to-end anastomosis of the bowel was then done, the section of gut, with attached mesentery, was split, and the margins were attached to the edges of the abdominal wound, the bladder having first been separated from its attachment. The edges of the gut segment were then nicely approximated to the edges of the bladder and the abdominal wound was closed. The power of retention of urine was 25 cc. at the end of 2 months. Mikulicz,⁶ having found experimentally with Herrmann that sections of bowel when removed did not always act in the same manner, reports a case in which a similar procedure to Rutkowski's was done, except that several steps at different periods were taken; the important stage being the certainty that the nutrition of the excised seg-

¹ Prager med. Woch., Nov. 2, 1899.

² Deut. med. Woch., No. 14, p. 219, 1899.

³ Centralbl. f. chir., No. 16, p. 473, 1899.

⁴ Ibid., No. 22, p. 641, 1899.

⁵ Canada Med. Rec., Mar., 1899.

⁶ Wien. med. Woch., Nos. 6-8, 1899.

ment was established, after which the operation was concluded. A power of retention of 100 cc. was obtained in the case reported.

J. H. Brinton,¹ in an article on the **choice of operation for stone**, advises the Trendelenburg position in the suprapubic method, because it favors the descent of the intestines and places the vesical fold of the peritoneum on stretch. A fistulous opening may be maintained where there is difficulty of micturition or when the calculus tends to reform. In contrasting the perineal incision with that above the pubes, the advantages are shown to be with the latter on account of the increased shock, hemorrhage, and augmented dangers of infection in the perineal route, although drainage is not so thorough as after a suprapubic operation. In cases of vesical calculus combined with hypertrophy of the middle lobe of the prostate the suprapubic operation is preferable. In cases of small or soft calculi crushing is indicated, especially if there is a fair degree of general health.

In the **treatment of tuberculosis of the bladder** W. Watson Cheyne² concludes that neither by medicine nor by surgery can we with any degree of certainty bring about a cure. Good hygiene, country or seaside air, and light exercise are of the first importance; while warm saline baths, rectal injections of warm water, and mustard to the hypogastric region are of benefit in the acute cases. Large quantities of milk should be the principal food, although cod-liver oil should be taken freely, with such drugs as arsenic, creasote, opium, and belladonna. Locally, washing out the bladder with mild germicides, such as 3% or 4% boric acid solution, is of benefit. Iodoform emulsion has failed to produce good results, and nitrate of silver injections are usually harmful. Some writers advocate 1:5000 to 1:1000 of bichlorid, used as instillation. Cocain and opium should be used with great care. The urine may be kept sweet by means of benzoic acid, or pills containing tincture of buchu or iodoform may be used. Surgically, the bladder may be opened, and rendered aseptic, or diseased foci removed. Hydraulic distention has also been used by some practitioners.

James H. Dunn³ advocates more **conservative measures in enlarged prostate**. In cases of arteriosclerosis, in which there is feeble micturition, with tendencies to congestion of the prostate and pelvis of the kidney, no operation, the author thinks, is of much benefit. A great many cases, under careful advice as to diet, hygiene, and excesses of all kinds, will frequently not require any more radical measures than occasional relief by means of aseptic catheterization, or, at most, aspiration. The writer quotes cases which had been comfortable for years, but fell into ignorant hands, with the subsequent train of cystitis, pyelitis, and even death. In summing up the group symptoms of numerous cases of prostatic hypertrophy the author believes that in not a few the hypertrophy is insignificant compared with other factors.

Stockmann⁴ analyzes the **results of the Bottini operation for prostatic hypertrophy**. The writer is an advocate of the more fre-

¹ Therap. Gaz., Oct. 15 and Nov. 15, 1899.

³ Jour. Am. Med. Assoc., Dec. 30, 1899.

² Brit. Med. Jour., Dec. 30, 1899.

⁴ Rev. de Therap., July 15, 1899.

quent use of this operation, giving a number of reasons therefor. His method of determining whether the cautery is sufficiently hot is to auscultate the symphysis, and judge from the hissing sound. When the cauterization is completed, he uses an irrigation of silver nitrate 1 : 1000. Of the author's 7 cases, 1 was cured, 4 were improved, 1 was unimproved, and 1 died of apoplexy 15 days later. Of 229 cases collected from literature, there were 51.5 % of recoveries, 26.2 % of improvement, 13.9 % of failures, and 8.2 % of deaths. The dangers of the operation are hemorrhage and urethral fever. Careful examination of the patient should be made, preliminary to the operation, by means of the cystoscope, microscope, and urinalysis; and the author thinks that a bilateral vasectomy should be done first, before proceeding to the more radical operation.

The treatment of prostatic ischuria is the subject of a lecture by Bottini,¹ who discusses the galvanocautery method. Two classes may be formed—(a) cauterization alone, (b) incision with the cautery. The author formerly thought that cauterization was oftener indicated, but later experience has shown that incision is more frequently required. Cauterization is indicated: (1) in prostatic enlargement of first degree in the supramontanal region or median lobe; (2) in initial hypertrophy of the median, with enlargement of one lateral lobe; (3) in hypertrophy of the median with vascular engorgement of the urethroprostatic mucous membrane. In spasm and some forms of chronic cystitis of the neck of the bladder cauterization is beneficial. As a local anesthetic a 1 % solution of cocain is used. Separation of the eschar begins on the eighth and continues until the twenty-fifth day. The catheter is allowed to remain if its use causes pain. A 2 % solution of sulphocarbolate of zinc is employed to wash out the bladder when the secretion is mucopurulent. Benefit is not seen usually until the wound has healed.

M. Aubry² states that **massage of the prostate** acts in two ways: the ducts of the glands are emptied mechanically, and congestion is reduced by stimulation of venous return; the nutrition of the gland is increased by alterative stimulation and the absorption of exudative products. The writer recommends massage in the stage of acute inflammation of the parenchyma of the gland, and in the last stage it aids resolution. In blennorrhagia with a slight exudate of mucus, which the author thinks is due to congestion, massage is of benefit. In cases of chronic prostatitis the treatment recommended is massage of the prostate, combined with irrigation of the urethra and bladder, the diagnosis being made by means of the two-glass test, with microscopic examination of the exudate.

The dangers of the Bottini operation is the title of a paper by Willy Meyer,³ who calls attention to the fact that all operations devised for this disease have elements of danger in them; the principal dangers are septicemia and pyemia, with secondary embolism of the pulmonary

¹ Clinica Moderna, An. 5, No. 39.

² Gaz. hebdom. de méd. et de chir., Sept. 17, 1899.

³ N. Y. Med. Rec., Jan. 14, 1900.

artery. The germs gain access to the circulation by way of the kidneys, or from the infected thrombi in the prostatic veins, or a part of an infected thrombus is torn off and becomes an embolus, which finally lodges in the lungs. The larger the prostate, the greater its venous blood supply; and the more intense the catarrh of the prostatic urethra and bladder, the greater the liability of infection and absorption.

The **operative treatment of hypertrophied prostate** is the subject of a paper by H. H. Young.¹ After reviewing the various methods in use, the author concludes that prostatectomy, performed early, is the best operation. He thinks that in some reported cases the operation has been incomplete, the lateral lobes, which cause most of the trouble, being untouched. Examination of pathologic specimens has led the writer to the belief that the principal trouble is caused by the downward dislocation of the urethra by hypertrophy of the lateral lobes. The author's operation, of which 5 cases are reported, is done by means of a perineal incision combined with a previous suprapubic cystotomy.

Du Chastelet² calls attention to a method of **painless lithotripsy under the influence of rectal injections of antipyrin**. A solution composed of antipyrin, 24 grains; laudanum, 10 drops; and water, 3 ounces, was injected into the rectum 45 minutes before the operation. The stone was crushed and removed with entire absence of pain, and although the operation lasted over a half hour, the bladder was not sensitive to touch.

E. L. Keyes³ reports a case of **castration for hypertrophy of the prostate** in which there was complete failure, as far as reduction in size of the prostate was concerned. The conclusion of the writer was that the prostatic enlargement, which treatment had not affected, was largely peripheral. The preexisting cystitis had been growing less severe before the operation, which had produced no effect on it. The irritability had remained about the same, the slight improvement shown after operation being probably due to the irrigations. The further indications were, in this case, a perineal prostatectomy with lithotripsy.

R. Matas⁴ presents his conclusions on **exstrophy of the bladder**, with special reference to Maydl's operation: (1) Autoplastic methods at present proposed are unsatisfactory and merely palliative. (2) Of methods which involve bladder excision and transplantation of the ureters in the rectum, Maydl's is technically the most satisfactory. (3) This operation offers the best chance for correcting the epispadias accompanying the condition. (4) From a prognostic point of view, this operation is the best. (5) The theoretic technic of Maydl's operation is simple; practically, it is a long and difficult operation, and should be done only by those whose training has rendered them familiar with abdominal work. (6) The operation is applicable only to selected cases, with healthy kidneys and ability to react from severe shock.

¹ Va. Med. Semi-Monthly, Dec. 8, 1899.

² Ann. d. mal. d. org. genito-urin., No. 7, 1899.

³ Jour. Cutan. and Genito-Urin. Dis., Dec., 1899.

⁴ Jour. Am. Med. Assoc., July 29, 1899.

M. Rochet,¹ at the meeting of the French Association of Urology, Oct. 20, 1899, read a paper on **resection of the perineal nerve for painful cystitis**. He reports 3 cases of urethrocystitis with difficult micturition in which resection of the perineal branch of the internal pudic nerve on both sides afforded good results. As the deep and superficial perineal muscles are supplied by these nerves, pain and tenesmus disappear when they are cut. The operation consists in cutting down upon the internal pudic as it passes out of the small sacrosciatic notch, as it divides into the perineal and dorsal nerves of the penis. The perineal is divided and the dorsal left intact. As a last resource this operation is available in treatment of cases of cystitis which operation has failed to relieve.

Michel and Grosse² report a case of **rupture of the bladder** in a patient with stricture. There had been an attack of gonorrhea 20 years previously. Marked difficulty in micturition had been present for 2 years. Before admission to the hospital there had been complete retention of urine for 10 days, and only a small quantity of bloody urine was passed during the 5 days following, when severe abdominal pain, with vomiting and peritonitis, followed. Instrumentation showed an impassable stricture of the urethra. Suprapubic cystotomy was done, but the patient died a few hours later. Autopsy showed a rent on the left lateral aspect of the bladder, below the peritoneal reflection. The interesting feature of this case is its rarity in association with stricture.

Haven³ reports 2 cases of **incontinence cured by gradual vesical distention**. A 4% boric acid solution was used in both cases, which were in girls of 18 years each, who had wet the bed nightly from earliest infancy. When awake, they were unable to retain the urine for longer than a few minutes. Examination showed the bladder capacity of one case to be 8 ounces under pressure, while that of the other was only 3½ ounces. Treatment consisted in distention of the bladder until discomfort was caused, and in holding the solution as long as possible. Every alternate day this procedure was carried out until a capacity of 20 ounces was reached. A cure was secured in 3 months in one case, and in 5 months in the other. No abnormality except a small bladder was found in either case.

Webber and Duffet⁴ report the **successful removal of one testicle** for prostatic enlargement in a man of 87. The operation was done for retention of urine with cystitis, and was preceded by a suprapubic cystotomy with drainage. The left testicle was removed under local anesthesia, and on the following day it was possible to introduce a soft catheter. The prostatic enlargement subsequently subsided, so that catheterization was unnecessary, and micturition became voluntary. Recovery was excellent.

Total resection of the bladder, it is stated by Modlinski,⁵ has

¹ Phila. Med. Jour., Nov. 18, 1899.

² Ann. d. mal. d. org. genito-urin., Sept., 1899, p. 970.

³ Boston M. and S. Jour., June 15, 1899.

⁴ Lancet, Aug. 1, 1899.

⁵ Centralbl. f. Chir., No. 27, 1899.

been done 12 times—on males, 7 times, with 4 deaths; on women, 5 times, with 2 deaths. The author has performed the operation twice, with one fatality. The following are the indications for the operation: (1) Relapse following a less radical operation, or when the bladder-wall is extensively involved in a tumor growth. If the latter is benign, the prognosis is favorable. (2) Malignant growths involving the structures near the ureteral orifices, but not extending beyond the bladder; prognosis unfavorable. (3) Secondary involvement of the bladder from the uterus; in which case removal of both organs is indicated. In the male, the bladder is best removed by the sacral incision, as for rectal cancer; in the female, by suprapubic incision or *per vaginam*. The ureters are implanted into the vagina in the female, and a reservoir is made in males by detaching the lower part of the rectum and closing its upper divided extremity, the lower end of the upper segment of gut being fixed to the margins of the external wound.

H. H. Young¹ reports a case of **hydraulic dilation of the bladder**. The trouble began ten years previously, and was treated as gonorrhea, with injections, which aggravated the symptoms. Finally, the patient wore a rubber urinal, the urine being voided every 15 minutes, with great tenderness of the urethra. Under forcible distention the bladder capacity was 20 cc. The morphin habit had become established, the patient taking $\frac{1}{2}$ of a grain 3 times daily. The treatment was systematic hydraulic dilation, which increased the bladder capacity to 100 cc. at the end of the third week. The urinal was put aside and the morphin was abandoned. Micturition was reduced in frequency, taking place once every $2\frac{1}{2}$ hours.

Robert Newman,² in an article on Bottini's operation and other **methods of treatment of the enlarged prostate**, states that he has been using his own modification of Bottini's instrument since 1886, and favors cauterization, in several sittings, rather than a severe or, it may be, too deep a destruction of the gland, which causes sloughs and may lead to septicemia; or a severe prostaticorrhea may follow, which is difficult of cure. The earlier the treatment, the better the result. Freudenberg's instrument is a distinct improvement on the original Bottini, although the writer thinks the future has yet to show the ideal instrument.

A. J. Downes³ describes a **new instrument for the separate siphonage of urine**, which, in comparison with the Harris instrument, the author claims has certain advantages. The following are the differences: "A much smaller caliber, as a whole; a simpler curve at the beak end; a longer and more certain bladder-partition; one definite fixed relation between the beaks and the partitioning medium; the absence of all unnecessary suction apparatus; the absence of a spring for elevating the partition; the introduction of a new feature—siphonage alone—for the withdrawal of the individual kidney urine."

In presenting a **new method of performing perineal prostat-**

¹ Maryland Med. Jour., Dec. 9, 1899.

² Med. News, Sept. 23, 1899.

³ Phila. Med. Jour., July 2, 1900.

ectomy, P. J. Freyer¹ calls attention to the various methods now in use, and states that in his opinion the vast majority of cases of senile prostatic hypertrophy are best treated by careful, cleanly, and judicious catheterism. The author's method is a modification of Dietl's, and consists of a preliminary perineal urethrotomy, which allows the growth to be examined by passing one finger into the bladder, and, with a finger in the rectum, allows the growth to be accurately defined, which can not be done otherwise except by a suprapubic opening, which is much more serious. A crescentic incision is carried from the lower end of the perineal wound around the anus to the coccyx, and the dissection is carried deep into the ischio-rectal fossa. A finger is hooked around the growth, which is drawn into the wound; the capsule is incised and the mass removed, a thin layer being left to support the bladder-wall. A tube is passed for drainage. The author claims that in selected cases this operation presents many advantages.

Leonard Freeman² speaks very highly of the **Bottini operation in hypertrophy of the prostate**, and reports 8 cases, with details, in which there was no fatality, and the results were so good that he expects to continue the operation in suitable cases. Many of the author's cases recovered in 3 weeks, although a much longer time was required by others. Epididymitis was found to be the most annoying complication, occurring in 5 cases, and not developing before a week had elapsed; suppuration occurred in 3 cases.

Reginald Harrison,³ in commenting on some **structural varieties of enlarged prostate** relative to treatment, thinks that the failures in the recorded cases are due to the indiscriminate application of some special operation without regard to the pathology of the particular case operated on. The writer asks, for example, What good would accrue to a patient suffering from an engorged prostate, on whom a suprapubic prostatectomy were done? Or would relief follow, when there was an adenomatous-like condition of the prostate, if vasectomy were done? Or if the prostate were fibroid, would castration effect a cure? The author recognizes the difficulty in determining the exact conditions, and thinks that as vasectomy has never been followed by any harm, it should first be tried; and if there is no improvement, the case is at least no worse, and prostatectomy is the operation indicated. The same author⁴ writes on **vasectomy relative to enlarged prostate and bladder atony**, and states that since 1893 he has performed the operation over 100 times, without ever having had any harm result or having heard any regret expressed, except in some cases in which the recovery was not so complete as anticipated. The object of the present paper is rather to call attention to physical changes in the bladder due to the formation of trabeculae or pouches, which prevents the muscular power of the bladder from acting properly, and consequently defeats the end accomplished by causing shrinkage of the prostate. The author quotes cases in which such pouches have been formed by calculi, stricture, or traumatism when

¹ Brit. Med. Jour., Mar. 24, 1900.

² Lancet, Aug. 5, 1899.

³ Phila. Med. Jour., Dec. 23, 1899.

⁴ Lancet, May 5, 1900.

the bladder was distended, and altered relationship took place between the mucous and muscular coats of the bladder, so that, while the power was not sensibly diminished, it could not be exerted as a propulsive agent. The writer concludes that vasectomy has been shown to be very useful in the earlier stages of hypertrophy of the prostate, but that when the degenerative changes are of a fibrous nature, prostatectomy is indicated. If bladder changes of the nature of sacs or pouches have occurred as a result of prostatic obstruction, the prognosis for restoration of the normal functions is very bad, but ease of catheterization may be secured by causing shrinkage of the prostate. The author's best results have been border-line cases, in which there was the beginning of structural bladder changes, and which required constant catheterization; in such cases vasectomy produced normal micturition. The author has modified the operation of vasectomy by making a small incision over the duct and using torsion without ligation. Castration obliterates sexual power, but vasectomy does not appear to do so.

J. Rilus Eastman¹ reports a case of **exstrophy of the bladder** operated on by Sonnenberg's method. In the author's case examination of urine disclosed disease of both kidneys, rendering rectal implantation inadvisable; hence the ureters were detached from the bladder mucosa and attached to the dorsum of the epispadiac penis. The bladder was removed and the wound edges were coaptated about the ureters as they passed over the pubis. Gangrene took place in the left ureter, which communicated with the more extensively diseased kidney, and both kidney and ureter were removed. A semispheroid cup communicating with a rubber urinal, which retains urine perfectly and is attended with no discomfort, was fitted over the operation area. The author thinks Sonnenberg's method preferable in cases of diseased kidneys to that of Maydl, although the latter is indicated in cases in which the kidneys are normal.

Ramon Guiteras² presents **diagrams of the genito-urinary tract, with a table for keeping records**, which he uses in hospital and private practice, with the advantage of uniformity and thoroughness. In the diagrams an anterior and a posterior view of the genito-urinary tract are given, showing the kidneys, ureters, vesicles, prostate, vas, testicles, etc. In the anterior view the kidneys, bladder, and urethra are split, showing their conformation, in some cases enlarged, so as to show in interesting cases, by means of drawings on the outline figures, any pathologic condition, enlargements, or abnormalities. In the table, or case-blank, are headings, first for the family history and then for the personal history, past and present, and the principal symptoms; and following that are headings for the examination, which are very thorough. The author has derived great satisfaction from their use.

How to do the Bottini operation on the hypertrophied prostate is the title of a paper by Bransford Lewis.³ The patient is prepared in the same manner as for any of the major operations. Five-grain capsules of urotropin should be given every 3 or 4 hours for 2 days before the

¹ Jour. Am. Med. Assoc., May 5, 1900.

² Phila. Med. Jour., June 2, 1900.

³ Internat. Jour. Surg., Oct., 1899.

operation. Aseptic precautions having been taken, a soft rubber catheter is inserted and the bladder is repeatedly washed out with warm boric acid solution. The bladder is drained completely, and half a dram or a dram of 4% cocain solution is injected into the vesical neck and prostatic urethra. The Bottini instrument is then tested electrically to see whether the blade heats to the right temperature and whether the ice-water current is working properly. The bladder is then dilated with air or boric acid solution—preferably with air, as it is believed that complications have occurred by the solution becoming overheated and scalding the surrounding tissues. After the instrument has been introduced the beak is reversed so that the blade is opposite the prostate, which is confirmed by a finger in the rectum. The instrument being in position, the current is turned on, and the rapidity of the passage through the tissues depends on the intensity of the heat and upon the hardness of the tissues, although it is well not to progress too rapidly. An incision of 3 cm. or 3.5 cm. requires about $1\frac{1}{2}$ minutes. The author thinks that it is well to make a long incision, rectal touch guarding against cutting the posterior urethra. The blade is allowed to burn its way back, and when it is free, the lateral lobes are attacked, a 2.5-cm. incision being made. The instrument is then withdrawn. A soft rubber catheter is introduced to let air escape and to irrigate with boric acid solution. A burning sensation at the vesical neck is one of the first symptoms, although retention may occur, which condition is controlled by enemas of hot water or by rectal suppositories. In regard to a preliminary cystoscopic examination being made, the author thinks that it is contraindicated, on account of possible kidney involvement, although if there are no vital reasons why this painful procedure should be done, it is of value.

PLASTIC SURGERY, BURNS, ULCERS, AND GUNSHOT WOUNDS.

H. Wagner¹ has made a study of transplanted skin-flaps in Mikulicz's clinic. He founds his study on 51 cases. In 30 cases healing was complete, in 8 it was partial, and in 13 it was not obtained. In performing the operation the most rigid surgical cleanliness is necessary. In the later cases they used no disinfectants, employing only soap, water, and alcohol, the hands being washed with sterile water after having been prepared in the usual manner. If there are granulations on the wound, they must be curetted away. The skin to be utilized may be removed from the inner surface of the thigh, because in this situation the wound inflicted will cause the least troublesome after-results. When the flap is in place, it is not necessary to employ sutures. The region from which the flap has been removed is covered with boric acid ointment and the dressing is not changed for 10 days. About the fifth day after the transplantation the flap may be bluish-red or lighter red, or even white; and sometimes there are blisters on the surface, filled with a yellow, serous fluid. After the flap adheres sensation is entirely

¹ Beiträge f. klin. Chir., Heft 1, Bd. xxiv, 1899.

absent for 6 or 8 weeks, when it begins to show itself, first at the periphery, and gradually passing inward; hence it seems that the nerves grow from the margin inward, but not from below upward. Infection will produce failure; so will ill adjustment of the flaps, considerable hemorrhage underneath the flaps, or an insufficient blood supply to the flaps. This method of transplantation of the entire thickness of the skin is used in the treatment of leg ulcers, in the correction of deformities following burns, and in filling gaps left by the extirpation of morbid growths. For loss of substance on the hand or a finger, the Thiersch method should be employed in preference to this. In transplanting the whole thickness of the skin in the treatment of ulcers of the leg, 39% of the cases fail completely and 24% fail partly. In practice this method is not so generally useful as is the method of Thiersch.

Stransky¹ has made a study of the **return of sensation in transplanted flaps of skin**. He says that sensation begins to appear at the margin, that tactile sensation is first distinguished, and that the temperature sense and the sense of pain develop later. If the skin-flap is large, a considerable area may remain for quite a time or permanently more or less anesthetic. It is probable that the nerve end-organs which exist in the graft join with the nerves which enter into the graft from the tissues beneath, and carry out their original function. This is particularly the case with tactile sensation. [In Wagner's article, which was previously quoted, it was asserted, and apparently with reason, that the nerves grow from the margin inward, and not upward. Stransky thinks that nerves enter the graft from beneath and join the nerves existing in the graft.]

F. W. Robinson² has been impressed with the usefulness of the old method of **sponge grafting** in wounds, and advocates the employment of decalcified bone tissue, which he thinks superior to sponge.

Thomas H. Kellock³ writes on a **new method of skin grafting**. He uses it in cases in which the prevention of contraction is very important, and he combines two of the ordinary methods. He raises from some convenient portion of the body a piece of the whole thickness of the skin, surrounded by a narrow fringe of epithelium only, as in the Thiersch method (Fig. 45). After determining the dimensions and the outline of the piece of skin required in its whole thickness, and marking it out if necessary, small superficial grafts are cut on all sides of it with a sharp razor, and they are left attached at their bases to the margin of

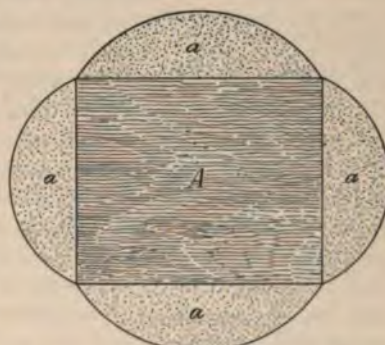


Fig. 45.—Diagram to represent a graft consisting of (A) a square piece of the whole thickness of the skin surrounded by (a, a, a, a) a fringe of epithelium only (Kellock, in *Lancet* Nov. 25, 1899).

¹ *Wien. klin. Woch.*, Nos. 32 and 33, 1899.

² *Clin. Jour.*, Jan. 17, 1900.

³ *Lancet*, Nov. 25, 1899.

the main part of the graft, and can be reflected upon it. The main graft is then dissected up in its whole thickness, the fat is removed from its under surface, the graft is laid on the raw surface, and the edges are spread out carefully. These edges rapidly adhere, and by fixing the main part of the graft, assist in insuring its growth. A number of these grafts may be planted and the fringes spread out, and they may be treated in the same way as Thiersch grafts. The scar formed by such a method shows little tendency to contract.

Gerald B. Webb¹ describes a simple method for the treatment of **ingrowing toe-nail** (Fig. 46). He uses a piece of silver wire about the thickness of an ordinary pin.



Fig. 46.—Illustrating method of treatment of ingrowing toe-nail (Webb, in *Med. News*, Dec. 23, 1899).

The wire is carefully bent under the free surface of the nail, and it catches and lifts up the lateral edges, as far back as the cuticle. The ends are carried along the back of the toe and are fastened to the skin with adhesive plaster, pieces of cotton being twisted around the points that have been bent away from the skin. The patient should wear this wire until the toe-nail grows out properly.

Fraser² strongly advocates the use of **local hot baths for the treatment of poisoned wounds** of the extremities.

Frederick Winnett³ describes an operation for **restoring the lower lip** after its entire removal for cancer. The operation is a modification of Regnier's. Winnett removes the lip by means of a pair of scissors, and extends the cut from the angles of the mouth to within $\frac{3}{4}$ of an inch of the edge of the chin. About 2 inches below this cut an incision parallel with it is made through the skin, down to the periosteum; this second cut is about 5 inches in length. A bridge of skin is thus raised, and a second bridge is raised below this, 1 inch in length and 2 inches in width. Enlarged glands are removed; the upper skin bridge is lifted up, placed in contact with the upper lip, and anchored to the periosteum; and the lower incision is sutured, its ends being brought together in a vertical direction, the lower bridge of skin being thus forced up to cover the wound left by the removal of the upper bridge.

Elder⁴ discusses **electric burns** and their treatment. He says that such burns differ notably from other burns. Early after the injury the condition resembles moist gangrene or frost-bite. There is severe pain and much shock, the shock being due partly to the burn and partly to the electricity. These burns require much longer to heal than do ordinary burns. Sloughing occurs and attacks particularly the muscles and the blood-vessels. The best treatment is to keep the limb in a warm bath of carbolic acid of the strength of 1:1000, looking out carefully

¹ *Med. News*, Dec. 23, 1899.

² *Canadian Jour. Med. and Surg.*, Aug., 1899.

³ *Montreal Med. Jour.*, Jan., 1900.

⁴ *Therapist*, Mar. 15, 1900.

for secondary hemorrhage. When a line of demarcation forms, the dead tissue must be removed. Not unusually amputation is required; but if amputation is performed, the skin-flaps should not be closed, because a great amount of muscle is certain to slough away. The wound should be permitted to heal by granulation, being grafted later if necessary. A solution of formalin causes too much pain to use on these burns. The burn occurs at the points of entrance and exit of the electric current, and the intervening tissues seem to escape injury. In some cases a current of 600 volts causes death, and in other cases a much more severe current produces only burns. In some of the cases which have died there has been no evidence of burning, and in many of the cases which have not died there have been most extensive burns. [The wisdom of using a carbolic acid bath seems very questionable. Carbolic acid tends sometimes to cause gangrene, and an electric burn is liable to become gangrenous. Carbolic acid might increase this unfortunate tendency of the burn and make it a reality.]

Reid¹ writes on the **treatment of burns and other superficial injuries**. He thinks that it is improper to place dressings in immediate contact with a burn. He uses a wire cage, which prevents contact and yet allows the application of dressings to protect the wound. If the burn be on a limb, a cylinder of wire can be made so as to surround the limb, padding preventing contact with the wound.

J. L. Wiggins² advocates **skin grafting with dried epidermis scales**. He prepares the part for obtaining the scales as follows: The foot is scraped to remove the outer layer of epidermis, washed in a strong solution of bichlorid of mercury, and covered with a moist boric acid dressing, rubber tissue being placed upon the dressing to keep it moist. In 12 hours this dressing is taken away and the surface is scraped with a knife. A mass of cells is obtained, which is put in a mortar, the mortar being placed in a water-bath at a temperature of 115° F., and the mass is stirred until it is thoroughly dry. The cells may be applied to the granulating surface in one of two ways: The granulating surface may be covered with rubber tissue perforated with numerous holes, so that the granules project through the holes; or the surgeon may mark out a space about $\frac{1}{4}$ of an inch in width around the entire margin of the granulating area, place numerous desiccated cells in this region, and cover them with strips of rubber tissue, filling the center of the ulcerated area with strips of gauze and applying dressings in the usual manner.

Paczauer,³ in speaking of the **treatment of varicose ulcers**, maintains that when these ulcers are not cured by ordinary methods, the internal saphenous vein should be ligated and the ulcer covered with a transplanted cutaneous flap.

Chipault⁴ advocates the treatment of some varicose ulcers by **nerve-stretching**. He stretches the nerve supplying the skin region in which the ulcer exists. This nerve is stretched at a part not very distant from the ulcer, but not so near that the wound will be likely to become in-

¹ Brit. Med. Jour., Oct. 28, 1899.

² Chicago Railway Surgeon, Aug. 8, 1899.

³ Wien. klin. Rund., Aug. 6, 1899.

⁴ Rev. de chir., Nov., 1899.

fect. The internal saphenous nerve is the one usually stretched. The sciatic in its popliteal portion may be stretched. The stretching is applied to the musculocutaneous branches. After the nerve has been stretched the ulcer is scraped and put in an aseptic condition. In some cases considerable skin is excised with the ulcer, and after this has been done the edges of the wound are sutured together.

F. E. Bunts¹ advocates the use of **powdered iron ore** as a **dusting-powder** for varicose ulcers. He uses the red, granular ore, which is pulverized and sterilized in test-tubes by dry heat. Over this powder there may be applied gauze wrung out of a 1 : 8000 solution of corrosive sublimate. Powdered iron ore should not be applied to the face, as it may leave a permanent discoloration.

In some remarks upon the **gunshot wounds of the reduced caliber rifles** in the Santiago campaign La Garde² compares the results of the experimental work at the Frankford Arsenal with the actual results seen by him at Siboney. His conclusions are as follows: (1) That there was much shock following a wound; men who were hit fell back to the rear at once, often for slight wounds. (2) In regard to explosive effects of the lead bullet and the new projectile, the author saw only one case, and attributes it to the fact that most of the wounds were received beyond the zone of explosive effect, or else were quickly fatal, such wounds being in the brain or in organs containing much fluid, and there was not time for study. (3) Experimentally and by experience the smaller bullets made small wounds of entrance and exit in the soft parts, and quickly healed. (4) Experience does not confirm the experimental view of many, that hemorrhage is severe when vessels are injured; of 1400 wounded, not one died of external bleeding. (5) Injuries to shafts of long bones, outside the explosive zone, show less comminution with the small bullet. This was true of the Mauser bullet in Cuba. (6) Injuries to the articulating ends of bones beyond the explosive zone were guttered, and the joint was less harmed by the new bullet. This was confirmed in Cuba. (7) The new bullet lodges less frequently than the old. This frequency of lodgment is still undetermined, although there was a surprisingly large number of lodged bullets in the American army, owing, the writer thinks, to the greater distance at which the Spanish fire became effective. (8) The lead bullet leaves fragments more frequently than the hard jacketed bullet. The truth of this was demonstrated in the campaign. (9) Foreign bodies are carried into the body more frequently by the old bullet than by the new. This was confirmed, as but few instances of this were seen. (10) Gunshot wounds of the lungs showed a higher percentage of recovery with the modern bullet. This was fully borne out by the Cuban campaign. (11) Less disfigurement of the face is caused by the new bullet. Several cases proved this to be a fact. (12) The new projectiles are more humane and fewer amputations are necessary.

In the *Archiv für klinische Chirurgie*, Bd. LIX, Heft 1, Eichel³

¹ Cleveland Med. Jour., Oct., 1899.

² Boston M. and S. Jour., Jan. 18, 1900.

³ Abstract in *Ann. of Surg.*, Nov., 1899.

discusses **gunshot wounds of the pericardium**, and states that this condition may exist without injury to the heart muscle, although the existence of such an injury can be positively known only during an operation or at necropsy. Cases in which proof is wanting are placed in a class called "cases with probable injury to the pericardium," accompanied by clinical signs and the anatomy. The variations of the anatomy of the pleura and pericardial sac are shown by illustrations. In operations on the pericardium it is very important to avoid the pleura, but according to Waldeyer it is almost impossible to reach the pericardium through the soft parts of the anterior chest-wall without injuring that membrane. The only way in which the operation can be done safely is to trephine the lower part of the sternum on the left side, or to perform resection of the sixth and seventh costal cartilages. The relations, of course, are different in the presence of inflammatory processes. An important symptom in cases of wounds is the substitution of a tympanitic note for the area of cardiac dullness. The treatment is expectant, although pericardiotomy is indicated if the heart's action is seriously interfered with or if there is absence of drainage in pus cases.

Keith and Rigby¹ have conducted a series of experiments on **modern military bullets**, and have made a study of their destructive effects. The modified English service bullets (the dum-dum and Mark IV) having been condemned by European experts, the former was characterized by von Bruns as "unnecessarily cruel, detestable and inhuman," and at the Peace Conference at The Hague this bullet was condemned. The authors state, however, that an examination of von Bruns' paper shows that he used not the service dum-dum, but an exaggerated form of it, called the "elephant bullet." In the series of experiments conducted by the writers the service bullets, ammunition, rifles, and revolvers of England, and of the Mauser variety, were used. The materials used were bars of soap, which accurately preserved the spin and course of the bullets; cadavers injected with preservative fluid, so that the destructive action could be measured; and skulls filled with semisolid plaster. In the experiments on soap the explosive effects obtained from fluid in compartments and the crushing effects seen in substances like bone are eliminated, and only the course of the bullet is shown. With the Mauser as a unit, the wounds made by various bullets are:

1. Mauser	1.	4. Sudan	4.5
2. Lee-Metford, Mark II	1.7	5. Dum-dum	5.4
3. Mark IV	2.	6. Martini-Henry	2.6

The unit = 784 square millimeters.

In other words, the present service bullet of England, the Mark II, has a destructive effect greater than the Mauser; but if either is converted into a dum-dum, then the destructive effect is increased threefold. The experiments also show that tendons and vessels, when in the direct axis of projection, are cut through; but if outside that axis, but still in the destructive track of the bullet, they are practically uninjured. If a bone is struck, however, the result is different, wide destruction taking place,

¹ Lancet, Dec. 2, 1899.

the fragments acting as missiles. According to German experimenters, no bullet entering the skull with a momentum of less than 70 kilometers has energy enough to rupture it, and as none of our modern bullets has that momentum beyond 800 yards, all skull wounds showing explosive effects must occur within that range. In conclusion, the writers find that the destructive effects of the Mark II, the Mark IV, and the dum-dum bullets stand to the Mauser in the ratio of 1.7, 2, and 5.4 to 1. This result applies to flesh wounds, the bone-destroying and explosive tendencies of all, especially of the open-nosed or dum-dum bullets, being unnecessarily great.

Clinton T. Dent,¹ in a lecture on **small-bore rifle wounds and the humanity of the present war**, stated that he had seen between 2000 and 3000 wounds in the South African war, principally at the base hospitals, and that although the army medical organization was efficient, still he hopes that it will become more so in the future. With regard to the "humanity" of the war, it is undoubtedly true that the great majority of the wounds were from rifle and not from shell fire, but the presence or absence of septic diseases determines the degree of "humanity." The speaker stated that he had not seen a case of preventable septic disease, although in some parts of the area of operations wounds were not doing so well as they did at the outset. To the commissariat is due high praise and credit for the good health of the men. The stretcher-bearers were also highly efficient. The climate was ideal, and the open-air method was largely, if not entirely, followed. Antiseptic treatment was carried out from the first, antiseptic materials being in abundance and freely used. Of the first-aid package the lecturer could not speak definitely. The elaboration of detail necessary in a city hospital was frequently dispensed with, and, with the exceptional climatic conditions, with impunity. There was no pyemia, septicemia, or tetanus, and only one case of erysipelas was found by the speaker. The proportion of killed to wounded was about as usual—1 killed to 4 wounded; but the percentage of deaths from wounds was only 5%, compared to 14% of the 14th Army Corps in the German army in the war of 1870. The use of explosive or expanding bullets, the speaker thought, was very rare on the Boer side. With regard to the wound of exit healing before the wound of entrance, as noted by John Hunter, the speaker could see no difference between them. With regard to amputations following injuries to long bones, while the figures were not at hand, yet the speaker thought a remarkably favorable percentage of recoveries would be shown when contrasted with any previous war. Injuries to joints have also proved that restoration of mobility of these parts has frequently followed, regardless of whether the range was short or long. Admirable results have followed trephining in the present campaign, and, in conclusion, the speaker thinks that air and sunlight have been potent factors for good; precautions against overcrowding and good hygiene have also had their share in the "humanity" of the war.

¹ Brit. Med. Jour., May 19, 1900.

Henry D. Greenleaf¹ has collected 24 cases of **gunshot wounds of the chest** from the records of the Spanish-American war. From a study of these cases the author concludes that while the effect of the modern gunshot injuries to the chest is humane, a sufficient percentage of unfavorable results greatly modifies this claim, for of the 24 cases, 9, or about 37 %, developed hemothorax or empyema. The indications for treatment are to guard against infection and to check hemorrhage. The first procedure is to cleanse the part and apply the first-aid dressing, and to take special precautions during convalescence against infection and exposure ; and, secondly, to have it thoroughly understood among the soldiers that all chest wounds are serious, and that absolute quiet is necessary. The litter is to be preferred to the ambulance in transferring the wounded to the hospital, and the surgeon should use every effort, by strapping and drugs, to control internal bleeding.

H. Horace Grant² analyzes 253 cases of **gunshot wounds of the abdomen**. These cases are from a number of American surgeons, and are all operative cases. The mortality of the whole number was about 52 %. In 21 cases no perforation or serious hemorrhage was found. Undiscovered perforation or uncontrolled hemorrhage was found post-mortem in 28 of the 133 fatal cases ; 11 cases having marked peritonitis at time of operation recovered. The conclusion as to the question of whether the operation lessened the chances of life is that in no case was the result affected unfavorably. A table of 107 cases, reported by 15 surgeons, in each of which a lesion existed, shows 66 recoveries and 41 deaths. The writer maintains that the indications for an immediate exploratory laparotomy when a ball is traced into the abdominal cavity are imperative, and that there are no conclusive symptoms of penetration and fatal injury in many cases until too late for hopeful surgery. In cases difficult to diagnosticate the general symptoms should be the guide, operation having the benefit of the doubt.

The **first-aid package in military surgery** is the subject of a paper by the elder Senn.³ The writer traces the progress of occlusive dressings in use by different nations, and comes to the conclusion that dressings for use in the field must meet the following requirements : (1) The material must be antiseptic ; (2) must be resistant to chemical change for a long time ; (3) must contain a fixation material which will prevent displacement ; (4) must be of a size not to inconvenience the soldier or meet with objection from military authorities ; (5) wound secretion must be allowed free evaporation. Bullet wounds should never be touched before the first-aid dressing is applied. Bogdan has shown experimentally that the growth of microbes in 24 hours under antiseptic and under aseptic dressings was as 1 : 44. Therefore antiseptic dressings are necessary. The writer's formula meeting the conditions is boric acid 4 parts and salicylic acid 1 part. The primary wound secretion dissolves part of the powder and forms an antiseptic fluid resembling Thiersch's fluid. As fixation of the dressing can not be had by the roller bandage

¹ N. Y. Med. Jour., Aug. 26, 1899.

² Va. Med. Semi-Monthly, Jan. 12, 1900.

³ Phila. Med. Jour., July 22, 1899.

during transportation, rubber adhesive plaster must be used, and a retaining bandage over, and not under, the clothing applied. In wounds of the extremities the seam of the trousers may be opened, the underclothing cut sufficiently, and the dressing applied. In gunshot fractures fixation is of the utmost importance, and an extemporized fixation dressing should be applied before transportation to the rear. The writer would emphasize the following points: "(1) First-aid packages are indispensable on the battle-field in modern warfare. (2) The first-aid dressing must be sufficiently compact and light to be carried in the skirt of the uniform, or on the inner surface of the cartridge or sword belt, to be of no inconvenience to the soldier or in conflict with military regulations. (3) The Esmarch triangular bandage is of great value in the school of instruction, but in the first-aid package it is inferior to the gauze bandage. (4) The first-aid package must contain in a waxed aseptic envelope an antiseptic powder, such as borosalicylic powder, 2 sterilized safety-pins wrapped in tin-foil, and between this package and the outside impermeable cover 2 strips of adhesive plaster 1 inch wide and 8 inches long. (5) The first-aid dressing must be applied as soon as possible after the receipt of the injury, a part of the field-service which can be safely entrusted to competent hospital-corps men. (6) The first-aid dressing, if employed behind the firing line, should be applied without removal of the clothing over the injured part and fastened to the surface of the skin with strips of rubber adhesive plaster, the bandage being applied over and not under the clothing. (7) The first-aid dressing must be dry, and should remain so by dispensing with an impermeable cover over it, so as not to interfere with free evaporation of the wound-secretion. (8) The first-aid dressing should not be disturbed unnecessarily, but any defects should be corrected at the first dressing-station."

At a meeting of the Royal Med. and Chir. Soc., Frederick Treves¹ made an address on the **wounded in the South African war**. He stated that the great difference between the old and new weapons consists in the high velocity and greater range of the latter, but the modern weapons are not so effective, measured purely by the amount of damage they can do. It has been asserted that the mechanical power of a bullet is represented by the product of the mass into the square of velocity, but this formula could now be proved erroneous. Pieces of shrapnel make very clean wounds, and lyddite has not the terrible effects ascribed to it. The speaker never found pieces of felting carried into the wound. In about 20% of the Mauser wounds the bullet was retained, but a circular exit wound was rare when a bone was struck, the largest exit wounds being produced when the range was short. Hemorrhage was rare. The majority of fractures from Mauser bullets were transverse; the worst fractures being those of the head of the humerus and of the lower end of the fibula. Gunshot wounds of the head usually required operation. As regards abdominal injuries: (1) the proportion recovering without operation was very high, and (2) operative treatment on the field was very discouraging. Treves says that 60% of abdominal

¹ Lancet, May 12, 1900.

wounds recovered without any operation, one reason being that the men were fasting when shot. The bowel wound of a Mauser is very minute, and seems to arrest peristalsis. The conditions which indicated operation in abdominal injury were: (1) When the case was seen within 7 hours after injury; (2) when the transport was short and easy; (3) anteroposterior wounds above the umbilicus when the bullet had escaped; (4) extensive hemorrhage; (5) some wounds below the umbilicus, especially if hemorrhage had occurred and the bullet had escaped. Operation was contraindicated: (1) If more than 7 hours had elapsed; (2) in case of long and arduous transport; (3) in transverse and oblique wounds above the umbilicus; (4) in all cases of retained bullet; (5) in all wounds involving the liver and the right kidney, because these recovered; (6) in most cases of wounds below the umbilicus, because these usually got well. There were, in fact, extremely few cases suitable for immediate operation on the field. During the discussion Clinton Dent said that, considering the climate of South Africa, the square marquee tent made the best base hospital. With regard to the extraction of bullets, they should be removed if subcutaneous, if pressing on nerves, if the mantle is split or the bullet deformed, if the bullet prevents the proper union of bones, and in cases of suppuration. Rotation of the fragment in fractures was frequently present, and made reduction difficult. A large amount of callus was thrown out, and sometimes involved nerves. Gunshot wounds of nerves seemed more common than formerly, although complete division was rare. Nerves involved in cicatricial tissue caused great pain. Morphin, the speaker thought, increased the neurotic tendency. In wounds of the skull, those of the frontal region were the least serious. In abdominal wounds successful operations were rare, but the majority recovered without operative interference. In wounds of extremities the indications for amputation were gangrene, septic infection, or results of long transport. The 10% to 15% of lodged bullets in the Cuban war was probably exceeded in the present one. Of the wounded, 27% were injured by shell-fire and 73% by rifle-fire, and the mortality of 5.34% was very low. At Netley Hospital 26 of 92 cases of knee-joint injury returned to duty, 73 of the 154 cases of chest injury were returned as fit for duty, and 26 of the 76 cases suffering from abdominal wounds were able to resume their duties.

At the sixty-seventh annual meeting of the British Medical Association, held at Portsmouth, Aug. 1-4, 1899, a discussion¹ on the **diagnosis and treatment of gunshot wounds of the abdomen** was held. The question of asepsis on or near the field of battle is the most important in determining the surgeon whether to pursue the expectant plan or to interfere. Major Beevor said that in the Tirah campaign the only water accessible was unspeakably foul. Surgeon-General O'Dwyer thinks that until the conditions more nearly approach those of civil practice, gunshot wounds of the abdomen had better be treated expectantly. The ability to diagnosticate visceral or intestinal lesions early to a very great degree determines the fate of the injured. Senn's

¹ Brit. Med. Jour., Oct. 21, 1899.

method of inflating the intestines with hydrogen gas to determine whether perforation has occurred has given good results in the inventor's hands, and has the advantages that the gas is quickly absorbed and is sterile; but the method has been little used by European surgeons. The value of "the disappearance of liver dullness" is doubtful, as this sign has been found when no perforation existed, and normal dullness has been noticed in the presence of extensive intestinal rupture. Symptoms of hemorrhage and shock may also exist with or without intestinal lesion. The question of whether or not an abdominal wound is accompanied by a perforation can with certainty be known only by an examination of the whole bowel, and the conclusion would therefore be a laparotomy at the earliest possible moment, if an intestinal wound were possible. Major Beevor calls attention to the value of flushing with hot sterile solutions (105° – 110° F.) before, during, and after operating.

G. H. Makins,¹ in a letter from South Africa concerning the wounded from the Modder River, states that **wounds of nerves** are numerous. He has seen numbers of injuries to the median, ulnar, and musculospiral, alone or in combination, as well as isolated cases of injury to the great sciatic and spinal accessory. Complete section is probable in some of the cases, while contusion or laceration is the cause in others of the loss of power, with hyperesthesia. Ten cases of paraplegia from transverse section of the cord were noticed. Perforating wounds of the chest are common, producing slight symptoms. In 14 cases of abdominal wounds, 10 showed no serious symptoms, and will probably recover. In 4 cases peritonitis had occurred. In one of these an operation was done on the third day, and the case was doing well at the end of a week. The result of the experience on the operative cases is that "no patient should be operated on from the mere fact of apparent traverse of the belly by a Mauser or Lee-Metford bullet." Wounds of muscles or soft parts when healed become very hard, the ends contract, and the involvement of tendons and nerves is important on account of the impairment of motion and signs of nerve pressure.

In a series of letters from the military hospitals in South Africa, Clinton T. Dent² states that the **recoveries from many gunshot injuries** are so remarkably rapid as to mean probable return to duty in 2 months. All the gunshot injuries received at the battle of Colenso, about 4 weeks previously, were seen by the writer in hospital at Pietermaritzburg, and the greater number were "out-patients," although the extent of extravasation in some cases suggested that the injury was not confined to the parts traversed. In wounds of the hand and foot the bones are apparently drilled, without comminution, and heal without impairment of function. Wounds of the patella and knee-joint almost uniformly do well unless there is injury to the popliteal vessels or nerve. Extensive hemarthrosis may form in the knee, but subsides readily. Cases of apparent burning from the bullet after exit from the wound are reported. Injuries of the head and neck were not numerous. Shortness of breath following wounds of the thorax is usual when both lungs are injured,

¹ Brit. Med. Jour., Dec. 30, 1899.

² Brit. Med. Jour., Mar. 17, 1900.

even when there is no hemothorax—a condition often seen. In 2 cases of wound of the liver the recovery was uneventful. In gunshot wounds of the abdomen the writer states that full statistics are necessary before the question of operation can be decided; although the impression at present is that the results of laparotomy have not been encouraging. In Dent's ¹ second letter he states that cases have undoubtedly recovered when the heart muscle was injured, one case living for a week or two when the cavity of the heart was penetrated. Empyema did well in nearly all cases. In injuries of the head early and free exploration is imperatively demanded, especially in the "gutter-fractures," which, though apparently slight, and presenting no cerebral symptoms, yet revealed great destruction of the inner table; the injury of this sort being decidedly more marked than from the old round bullet, and being more frequently overlooked, as the scalp wound heals so quickly. In amputations of the lower limb, Syme's method was used in a number of cases, but the writer does not think it suited to traumatic cases so well as the subastragaloid method. In the third letter Dent ² says, in writing of injuries to long bones, that there is a great difference of opinion regarding the effect at long and at short range. Bullets striking the shaft of a long bone may become much distorted, and present the appearance of a ricochet. The amount of damage to the bone depends largely on the part struck as well as on the angle; the line drawn between the wound of entrance and exit, as well as examination by the x-rays, being misleading. In wounds of the cancellous parts of the long bones a clean hole is made only in certain situations. In many cases the condyles of the femur as well as the patella have been pierced without fracture. At very short range, if any bursting action were exerted, fractures of the femur extending into the knee-joint would be common, but few were found. The upper and lower ends of the tibia do not act in the same way, injuries of these parts rendering the preservation of the limb difficult. The writer also observed no cases in which the head of the humerus was drilled without fracture. In cases in which the lower end of the humerus was struck a piece was usually broken off. When the bullet has passed through the elbow-joint, very little trouble follows except from callus. The action of the Mauser on the shaft of a long bone may be the same as of the old round bullet: viz., breaking the bone into small fragments, which may be distributed along the track or carried out of the limb with the bullet. That some "doctored" bullets were used the writer states is true, but very rarely. "Fractures of long bones caused by the small-bore bullet at almost any range are almost invariably oblique." Compound fractures of the femur high up, which in previous wars have been so fatal, in the present campaign have done remarkably well, some cases recovering without amputation. The chief complication in fractures of long bones has been impairment of mobility from the large amount of callus thrown out, especially impairment of the musculospiral nerve in fracture of the upper part of the humerus.

¹ Brit. Med. Jour., April 21, 1900.

² Brit. Med. Jour., May 26, 1900.

Bardenheuer¹ reports a case of gunshot wound of the heart. The fifth and sixth ribs were resected on account of the acute traumatic anemia, the pericardium was laid bare, and an opening in the sac was exposed. Two liters of blood were removed from the left pleural cavity, and the tear in the pericardium was closed with a clamp, the operator believing that he had controlled the hemorrhage. The patient died half an hour later, and examination showed a tear in the posterior wall of the pericardium and an incomplete rent of the wall of the left ventricle not opening into the cavity.

X-RAYS.

John Hall-Edwards² commends the use of the Röntgen rays in military surgery. He regards the application of the apparatus to military surgery as one of the greatest advances of the century, and thinks that in the present South African war it does not receive the attention its importance demands. Its use dispenses with the old-time probing after bullets and reveals the amount of injury to bones, thus avoiding pain and possible infection. Simplification and improvement of the apparatus make its transportation practicable. From the fact that the surgeon who has charge of the x-ray apparatus seldom operates, and that the fluorescent screen requires a dark room, it is of little use in the field, negatives which can be placed in the hands of the surgeon being more useful. Reference is made to the value of a knowledge of photography and electricity, combined with some experience, to the field operator of the apparatus. The hope is expressed that in the rewriting of military surgery the x-ray may receive the attention which the subject merits.

W. W. Keen³ reports 2 cases, one showing the value of the x-rays, and the other how they may be misleading. In the first case a bullet in the popliteal space was on two occasions, by means of the fluoroscope and x-ray picture, shown to be in contact with the posterior surface of the tibia. When operation was performed, the ball was found imbedded below the surface of the bone. Figure 47 shows the skiagraph. This case illustrates the importance of properly interpreting what the x-rays reveal, as the errors to which they may lead have yet to be learned, and may give rise to serious consequences, especially in medicolegal cases. In the second case a diagnosis of diverticulum of the esophagus had been made. By means of the introduction into the esophagus of a coil of copper wire within a rubber tube, also of large perforated shot securely strung on a silk string, the metal was clearly traced by means of the x-ray and fluoroscope. A diverticulum was not revealed by this means nor by subsequent operation.

L. D. Judd⁴ discusses x-ray injuries, and claims that they arise from an "electrolytic action of current generated in the tissue by induction from the tube," the elimination of which inductive influence is of more importance in the avoidance of burns than the interposition between the patient and the tube of a metal plate or than increasing the distance

¹ Wien. med. Bl., Oct. 5, 1899.

³ Phila. Med. Jour., Jan. 6, 1900.

² Brit. Med. Jour., Nov. 11, 1899.

⁴ Phila. Med. Jour., Sept. 30, 1899.

between the patient and the tube. The static machine is regarded as being superior to all others, as it can be made to produce a constant current, thus eliminating the inductive influence. Its careful and intelligent use is considered almost a guarantee against all injuries.

Philip M. Jones¹ criticizes an article by L. D. Judd on the **causation of x-ray injuries** in which he claims that x-ray burns are caused by an electrolytic action of current generated in the tissue by induction from the tube. Jones endeavors to prove that, according to physics and electricity, this is an impossibility, and cites an experiment in confirmation, which experiment he also claims proves that the dermatitis often resulting arises from the radiant energy emanating from the tube in the form of what we call the x-rays.

William Allan Purey² discusses **x-ray burns** in reference to their causation and the length of time which elapses between the exposure and the manifestation of the injury, and in this connection criticizes statements made by G. G. Hopkins in which he claims that x-ray burns are due to destruction of the nerves of the part exposed caused by the passage through them of a greater quantity of electric current than they are able to transmit, and that burns are not usually manifested until several weeks have elapsed. Granting the assumption that x-rays are transmissible through conductors, Purey claims that there is no evidence proving that nerves are better conductors than other tissues, and histologic examination by competent men proves that changes in the nerve-fibers do not occur. With regard to the length of time elapsing before the burn is manifest, Gilchrist's table of cases is referred to, in which the longest time was 3 weeks; the average, about one week.

Walter B. Metcalf³ writes on **x-ray burns**, discussing and agree-



Fig. 47.—Bullet shown by x-rays (Keen, in Phila. Med. Jour., Jan. 6, 1900).

¹ Phila. Med. Jour., Oct. 28, 1899.

² Phila. Med. Jour., Jan. 27, 1900.

³ Phila. Med. Jour., Dec. 9, 1899.

ing with the theories advanced by L. D. Judd without adding anything new.

J. Rudis-Jicinsky¹ discusses the so-called x-ray burn, which he claims is a mortification or necrosis caused by nutritive disturbance arising from irritation of the peripheral sensory nerves, causing paralysis of the vasomotors of the vascular area exposed, followed by contraction of the arterioles and capillaries, and consequent interference with nutrition, due to overexposure. This mortification may manifest itself early, or not until weeks have elapsed, and may be characterized by lancinating pains, sensations of heat or cold, anesthesia, or hyperesthesia, with erythema. A red spot appears, surrounded by macules, vesicles, or pustules. Destruction of tissue, sometimes superficial, more often involving the subcutaneous connective tissue, follows. The process of healing is slow. Rest, cleanliness, and massage are important measures in treatment. Attention is directed to the fact that tissue in which the resistance is lessened by injury is more liable to x-ray injury. The intelligent use of the best apparatus, with short exposure, is necessary to prevent burns.

An editorial² on **Röntgen ray injuries**, commonly called burns, states that this term must be regarded as misleading, burns being due to the action of heat, and appearing at the time the agent is applied, whereas x-ray injuries do not appear often for several weeks, and Röntgen states that the rays have no calorific effect. Reference is made to Orleman's case, in which the injury did not appear for 3 weeks after the exposure, and which manifested other points of interest (severe and persistent pain, resistance to local treatment, and the fact that skin-grafts grew on tissue which looked gangrenous). Attention is called to the advisability of using the x-rays only when a definite advantage is to be gained, there being no assurance that injuries may not result even when proper precautions are observed. The rules suggested by F. H. Williams, of Boston, are commended: viz., the Crooke's tube should be placed 2 or 3 feet away from the patient when the fluorescent screen is used, and 3 feet or more from the plate in taking x-ray pictures. Interpose (a suggestion by Tesla) between the tube and patient a thin aluminium screen, grounded by being connected with a wire to the gas-pipe.

Daisy M. Orleman³ discusses the ill effects of the x-ray, and reports an illustrative case: A fracture of the femur was on three successive occasions examined with the x-rays for 7 minutes, 6 weeks elapsing between the first and second exposures and 8 between the second and third, the Edison apparatus being used. Three weeks after the last exposure a small portion of the area exposed began to inflame, and in spite of all attempts to arrest the process, went on to ulceration, and became exceedingly painful, greatly interfering with the patient's general condition. The sloughing area was excised and the wound closed. It reopened, and pain and sloughing continued until 6 months after its inception, when it began to improve, finally requiring skin-grafts to close it.

¹ N. Y. Med. Jour., Mar. 17, 1900.

² N. Y. Med. Jour., July 22, 1899.

³ Med. Rec., July 1, 1899.

To avoid such results from the use of the x-rays, two suggestions are made: First, have the patient 2 or 3 feet distant from the tube when using the fluorescent screen, and 3 feet distant when taking x-ray photographs; second, interpose between the patient and the Crooke's tube an aluminium screen. Regarding the treatment of x-ray burns, absolute rest and constitutional treatment are of prime importance, combined, of course, with local applications; and later, if necessary, skin-grafting and massage.

Arthur W. Goodspeed¹ writes on the **technic of x-ray work**, giving in detail his methods, in which he adheres to the older features, these proving, in his experience, most successful. Three excellent radiographs are given. The first shows the result obtained from a dense negative by making a positive on glass and then printing on paper from this. The second shows the result of the use of a "soft" x-ray tube used in the differentiation of masses differing little in density, as in demonstrating the presence of renal calculi. The third shows the result of the use of a "hard" tube used in the examination of masses differing greatly in density, as for radiographing a knee-joint. The importance of keeping the patient absolutely still during exposure and about from 10 to 12 inches distant from the tube, of having the part uncovered, and of avoiding overexposure is emphasized.

J. Rudis-Jicinsky² refers to the **usefulness and mistakes of the x-ray**. He states that its value in locating foreign bodies is universally accepted, while as a therapeutic agent it is still a matter for study and experimentation. He also asserts that it may have value in making the diagnosis between rheumatism and gout, as well as in the recognition of various intrathoracic and abdominal conditions.

An editorial³ refers to the question of **errors arising from the use of the radiograph**, to which Lucas-Championnière has called attention. The statement is made that the volume, dimensions, and form of the shadow vary with the distance of the object from the plate and from the light, a wrong position of either giving rise to serious error in the radiograph.

Norman Roberts⁴ discusses the relative value of the fluoroscope and skiagraph in the diagnosis of fractures. While he claims for the latter greater delicacy and accuracy, thus entailing greater expense and more time, he believes that the former, affording, as it does, a view of the condition from so many standpoints in so short a time, is the more serviceable.

Carl Beck⁵ calls attention to a **source of error in skiagraphy** arising from the skiagraph being taken from a position which does not reveal the line of fracture. He refers to a case in which an oblique fracture of the tibia, extending from the front upward and backward, with some overriding of the upper fragment, was not revealed by a skiagraph taken from before backward, but was clearly shown by one taken

¹ Phila. Med. Jour., Jan. 6, 1900.

² Am. X-ray Jour., Feb., 1900.

³ Med. News, Feb. 3, 1900.

⁴ Phila. Med. Jour., Jan. 27, 1900.

⁵ N. Y. Med. Jour., Jan. 6, 1900.

from side to side. The necessity of exposure from more than one point is thus indicated.

Carl Beck¹ discusses the relative value of the **fluoroscope and skiagraph in fractures**. He believes that the greatest usefulness of the former is obtained in preliminary examinations for determining the seat of fracture and the best position for the photographic plate. The latter shows the details of the fracture exactly and permits of its thorough study. He also mentions its value for future information, and sometimes for forensic purposes.

J. Rudis-Jicinsky² calls attention to the **value of the x-rays in the making of early and correct diagnosis in head injuries**, such as the existence and character of fractures, location of foreign bodies in the skull or eye, horny growths on the inner surface of the skull, and the presence of fluid or a blood-clot. A case is referred to in which by means of the x-rays a diagnosis of an epidural clot was made. The x-rays should be used only as an adjunct to the older methods of diagnosis. In order to secure success it is important to know the power of the apparatus used, the distance of the tube from the object and from the plate, and the angle at which the picture was taken; to have a knowledge of anatomy and pathology to enable one to make a correct interpretation; to work rapidly; to protect the patient; to make short exposures; to make more than one radiograph of each case; to keep the obliquity of the x-rays always in mind; and to use a proper screen for measurements and exactness of the pictures.

Charles Lester Leonard³ discusses the **limitations and value of a fluoroscopic examination**, and states that its value is dependent on the perceptions of the observer, there being no mechanical record of the evidence obtained capable of comparison with that of other observers or with a fixed physiologic standard. The method is also of recent application, therefore lacking in the perfection which experience gives. The absorptive, diffusing, or defracting properties of tissues on which the shadows cast by the Röntgen rays depend probably vary in different tissues, and in the same individual at different times, as is the case in pathologic conditions; and unless the normal with its physiologic variations is known, it is impossible to detect the pathologic. The Röntgen rays reveal a difference in the relative translucency of the lungs in proportion to the amount of air they contain, but whether such variation is physiologic or not is the question. This lack of knowledge of the normal with its variations to employ as a standard greatly detracts from the value of this means of diagnosis. The distinction of the less dense tissues and the study of motion will be the greatest future advances in Röntgen ray diagnosis.

Charles Verge⁴ presents a radiograph of a **bullet lodged in the epiphysis of the femur** two lines beneath the surface of the bone. The principal point of interest is the fact that the radiograph was taken through the bone. The bullet was successfully removed.

¹ Phila. Med. Jour., Feb. 17, 1900.

² N. Y. Med. Jour., Dec. 2, 1899.

³ N. Y. Med. Jour., June 6, 1900.

⁴ Phila. Med. Jour., Mar. 24, 1900.

John Hall Edwards¹ refers to **the x-rays in surgical work**, and states that the practical gain from the use of the method in the diagnosis of fractures is considerable, and not as yet fully appreciated by the profession. The belief is expressed that in the future all fractures will be "set" with the aid of the x-rays and the application of a special splint. The fact that many appearances in x-ray photography are misinterpreted indicates a lack of skill on the part of interpreters which can be improved only by experience. It is important that professional men superintend the use of the apparatus. Its use has rendered the employment of the probe in locating foreign bodies obsolete, and has rendered the diagnosis of fractures and dislocations possible without painful, dangerous, and unnecessary manipulations. When more fully appreciated, its use will prove a boon to both patients and surgeons.

Moullin² discusses the **application of the x-rays to medicine and surgery**. The causation of so-called x-ray injuries is referred to, and is ascribed to the ether waves recognized as light and heat, which are not considered identical with Röntgen rays. The injurious effects of these ether waves is seen after long exposure. The epidermis becomes dry and scaly; nails and hair often drop out; sometimes the superficial structures only, sometimes the deeper structures, are involved. This destruction of tissue is not considered to be due to defective circulation or innervation. All these injuries are characterized by distinguishing features: First, by a period of quiescence, then by decay, uninfluenced by treatment, followed by repair, which is often slow. The fact that these ether waves produce such injuries does not eliminate the possibility of their serving a useful purpose which may yet be discovered. Little hope can be entertained that they will ever prove destructive to the tubercle bacillus within the tissues, though there is no doubt that cases of lupus and eczema have been cured by them. Important improvements in apparatus and technical details have been recently made, such as the application of a method by which deeply buried objects can be located and the introduction of the Wehuel break. The time of exposure has been shortened, rendering the occurrence of injury less likely; the illumination is more steady; and clearness of definition has been increased, so that photographs of the soft parts can be obtained. The screen has been so nearly perfected that with suitable apparatus the slightest movement of the heart, lungs, and diaphragm can be studied in the living subject. Intrathoracic conditions which at first were regarded as almost impossible of demonstration can now be shown with the greatest distinctness. The x-rays are of inestimable value in military surgery. By their use bullets and other foreign bodies can be located in any portion of the body. The character and extent of joint injuries may be determined, as well as diseases of bone, sarcomas, tuberculous deposits, central abscesses, and necrosis. They afford valuable aid in the diagnosis of antral and other maxillary tumors, and in some diseases of the frontal and sphenoidal sinuses. The presence or absence of renal calculi can be determined, though biliary calculi can not be seen.

¹ Brit. Med. Jour., Oct. 21, 1899.

² Lancet, Aug. 19, 1899.

Lucas ¹ refers to the **localization of bullets by x-rays**, and mentions two illustrative cases, in one of which a bullet and its fragments, and fragments of bone carried with it, were located and successfully removed from the brain. In the second case a bullet entered the neck, and, passing behind the vessels and nerves, embedded itself in the second cervical vertebra, as shown by the x-rays. It was easily removed.

Lucas-Championnière ² refers to the **use of skiagraphy in fractures**, and points out that the information obtained by this means by incompetent men is often misleading, representing callus where no fracture existed, and greatly magnifying an existing break. The volume, dimensions, and form of the projected shadow vary with the distance of the object from the plate and from the light, a wrong position of the latter causing a marked change in the form of the projected part. The author cites an instance in which a contusion of the thigh was represented by a skiagraph as an ununited fracture. Such cases may give rise to damaging accusations against the surgeon.

Oberstabsarzt Baehren ³ calls attention to a case in which **self-inflicted injuries were diagnosed by means of the x-rays**. A soldier suffering from a swollen finger and hand, the result, as he alleged, of a horse-bite, was admitted into the military hospital. An examination by the Röntgen rays revealed 5 needles in the second and third interosseous spaces of the metacarpus. They were all removed and the hand became quite normal. It is presumed that he inflicted these injuries on himself in order to obtain his discharge from military service.

The elder Senn ⁴ highly commends the use of **the x-rays in military surgery**. He states that its value was demonstrated during the Spanish-American war in locating bullets in almost any part of the body; in ascertaining the existence, location, and nature of fractures; and in locating fragments of bone, which can all be done without pain or possible infection attendant on the use of the probe in attempting to locate bullets, for which purpose military surgeons have decided it should not be used in recent bullet wounds. The author states that in recent cases the first-aid dressing should be applied and all attempts to locate the bullet should be postponed until it is possible to use the x-rays. The importance of every military hospital and every army in the field being provided with x-ray machines and expert operators is emphasized. Its value in determining whether or not fractures in the proximity of joints involve the latter is referred to.

A. W. Crane ⁵ gives in detail a description of the **skiameter**, an instrument devised by himself, which is regarded as being superior to the photographic plate or the fluoroscope in examination of the respiratory organs, for which alone it is of service. This fact will greatly limit its use.

Robert Abbe ⁶ gives **some observations on the detection of small**

¹ Brit. Med. Jour., Oct. 21, 1899.

² Bull. et mém. de la soc. de chir., Jan. 2, 1900.

⁴ Phila. Med. Jour., Jan. 6, 1900.

⁶ Ann. of Surg., Sept., 1899.

³ Lancet, June 17, 1899.

⁵ Phila. Med. Jour., Jan. 6, 1900.

renal calculi by means of the Röntgen rays, and reviews all the cases recorded (27) in which a diagnosis has been made by this means. Stones the largest measurement of which was only $\frac{1}{2}$ of an inch have been shown. The following details with regard to the technic of picture-taking are given: Interpose between the patient and the plate rubber tissue, to prevent perspiration dampening the paper. Place the photographic plate well up beneath the patient's back. Easily penetrable stones give a better impression on short exposure. A wet plate may show nothing, but when dry and held in proper light a plate may give good results. A thin plate looked at in broad daylight shows nothing, but when held in front of a brightly illuminated sheet of clean paper, will give good shadow pictures. A thin plate, when moved rapidly from side to side, under proper illumination, will often display shadows which would not appear when it is held quiet. A dense plate that seems impenetrable will sometimes reveal exquisite detail of bone, etc., when illuminated correctly, either by direct or reflected light, with a proper screening of the observer's eyes. A properly closed box, like a fluoroscope, adapted to the size of the picture, screens the observer well and allows him to interpret shadows correctly. A skiagraph never shows so well as the negative.

The report of the Committee of the American Surgical Association on the **medicolegal relations of the x-rays** was presented by J. Wm. White¹ in May, 1900. The conclusions of the committee follow: "(1) The routine employment of the x-ray in cases of fracture is not at present of sufficient definite advantage to justify the teaching that it should be used in every case. If the surgeon is in doubt as to his diagnosis, he should make use of this as of every other available means to add to his knowledge of the case, but even then he should not forget the grave possibilities of misinterpretation. There is evidence that in competent hands plates may be made that will fail to reveal the presence of existing fractures or will appear to show a fracture that does not exist. (2) In the regions of the base of the skull, the spine, the pelvis, and the hips, the x-ray results have not as yet been thoroughly satisfactory, although good skiagraphs have been made of lesions in the last three localities. On account of the rarity of such skiagraphs of these parts special caution should be observed, when they are affected, in basing upon x-ray testimony any important diagnosis or line of treatment. (3) As to questions of deformity, skiagraphs alone, without expert surgical interpretation, are generally useless and frequently misleading. The appearance of deformity may be produced in any normal bone, and existing deformity may be grossly exaggerated. (4) It is not possible to distinguish after recent fractures between cases in which perfectly satisfactory callus has formed and cases which will go on to nonunion. Neither can fibrous union be distinguished from union by callus in which lime-salts have not yet been deposited. There is abundant evidence to show that the use of the x-ray in these cases should be regarded as merely the adjunct to other surgical methods, and that its testimony is

¹ Am. Jour. Med. Sci., July, 1900.

especially fallible. (5) The evidence as to x-ray burns seems to show that in the majority of cases they are easily and certainly preventable. The essential cause is still a matter of dispute. It seems not unlikely, when the strange susceptibilities due to idiosyncrasy are remembered, that in a small number of cases it may make a given individual especially liable to this form of injury. (6) In the recognition of foreign bodies the skiagraph is of the very greatest value; in their localization it has occasionally failed. The mistakes recorded in the former case could easily have been avoided; in the latter they are becoming less and less frequent, and by the employment of accurate mathematic methods can probably in time be eliminated. In the mean while, however, the surgeon who bases an important operation on the localization of a foreign body buried in the tissues should remember the possibility of error that still exists. (7) It has not seemed worth while to attempt a review of the situation from the strictly legal standpoint. It would vary in different States and with different judges to interpret the law. The evidence shows, however, that in many places and under many differing circumstances the skiagraph will undoubtedly be a factor in medicolegal cases. (8) The technicalities of its production, the manipulation of the apparatus, etc., are already in the hands of specialists, and with that subject also it has not seemed worth while to deal. But it is earnestly recommended that the surgeon should so familiarize himself with the appearance of skiagraphs, with their distortions, with the relative values of their shadows and outlines, as to be himself the judge of their teachings, and not depend upon the interpretation of others, who may lack the wide experience with surgical injury and disease necessary for the correct reading of these pictures." [The American Surgical Association unanimously adopted these conclusions as expressing the views of the Association. This gives them an indorsement of great value.]

OBSTETRICS.

By BARTON COOKE HIRST, M. D., AND W. A. NEWMAN
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PRELIMINARY AND GENERAL CONSIDERATIONS.

Mother versus Child.—[A most important question, and one that is extremely perplexing in its solution, not infrequently arises during the experience of the average obstetrician. It concerns the relative value of the fetal and maternal life in certain forms of dystocia. At first sight and in a general sense there can be but one reply to the question. When the difficulty resolves itself into the sacrifice of one life or the other, the fetal existence must not be considered; for humanitarian and medicolegal reasons the maternal life must be saved if this be possible.] Macvie¹ gives the subject most careful and scholarly attention. He remarks that when two lives are in danger the question which should be saved might become of the greatest difficulty, while it is necessarily of the first importance. The answer might ultimately rest on the relative mortality of different operative measures. It might also depend on the relative value of the maternal and the fetal life. Under normal conditions of health it might not be difficult to decide which life should be saved, but in cases in which the maternal life is certain to be shortened by existing incurable disease the decision might be very difficult. Cases of advanced carcinoma, pulmonary tuberculosis, or grave forms of valvular heart disease are instances in question. The choice of operative procedure here will involve the assumption of risk for both mother and child, and it now becomes largely obligatory upon the attending accoucheur to decide which should be subjected to the greater amount of risk. This difference leads to the question upon which data the relative value of two lives is to be determined. It seems to be a general rule that when mother and child are healthy, the procedure adopted is designed to save the life of the mother, and is generally approved by the husband and other relatives. Yet at 20 years of age the life-expectancy of a mother is barely equal to that of a new-born child, and at every subsequent pregnancy it is less. But life-expectancy tables are mostly useful for economic reasons and for life under average conditions. In this case the life-expectancy of mother and child is shortened by the mother's disease. The general practice seems to be to regard the life of the mother as the more valuable, although her life-expectancy might be 10 or 15 years less than that of the child. But mere duration of life does not determine the value of the life, and so 10 years of a mother's

¹ Lancet, July 29, 1899.

life—say, between 20 years and 30 years—are proportionately more valuable than the first 10 years of a child's life. Ethically regarded, the value of life consists in the discharge of subjective and altruistic obligations, instinctive or volitional as the case might be, and with such opportunity and capacity as the individual possesses. To this might be added the due performance of procreative functions, from which the life acquires a racial in addition to an ethical value. Life value is thus composed of three elements—personal, social, and racial. At certain periods of life the discharge of these obligations is an impossibility, and at such periods life has either not acquired or has lost its highest value. For example, the fetus *in utero* is a parasite performing no function whatever. Its existence involves a physiologic loss to the maternal organism. Unlike an arm or a spleen, it performs no duty in return for its sustenance. Its actual value can be expressed only by a minus quantity. Its potential value is equal to its extra-uterine life-expectancy. If that life-expectancy is by reason of dangers ahead reduced to a minimum, its potential value may never be realized. The new-born child is still parasitic, though detached; and though it inhales its own oxygen, it is still a physiologic loss to the maternal organism. The actual value is still a minus quantity, but it has begun to realize its potentiality by satisfying the parental instinct and contributing to the subjective element of life. The mother, on the other hand, has realized the potentialities of life. Value after value has been added to her existence, as consciousness, self-consciousness, and volition developed. The later added procreative function has given it a racial value. By living less to herself than any other being she attains a higher self-sacrificing value. She is directly and indirectly contributory to the life of her children, and her own life, to be accurately estimated, must be multiplied by some fractional sum of theirs. Unless the life-expectancy of the child covers the years in which the potentiality is converted into actuality, the relative values of the maternal and the fetal life will be that of actual against potential.

Antenatal Predisposition to Deafness.—E. Allen Fay, in his work entitled "Marriages of the Deaf in America" (Washington, 1898), specially treats of the probabilities of the production of deaf offspring as the result of marriages among the deaf. He finds that there has been an increase in the number of marriages of deaf persons in the present century in America, accounted for partly by the establishment of schools for the deaf and partly by the existence of a deep feeling of fellowship and sympathy between the deaf. These marriages have been somewhat less productive than others, but the difference is not great. On the other hand, deaf offspring are far more likely to occur in the families resulting from such unions than in those in which the parents possess hearing. Nearly 10% of marriages between the deaf result in the birth of deaf offspring. Further, the proportion of deaf children born therefrom is 8.6%, instead of probably about 0.1% in ordinary marriages. Congenital deafness itself is a *prima facie* indication of deaf offspring, but it is not conclusive evidence of such liability; indeed, the possession

of deaf relatives is shown by Fay to be a far more trustworthy indication of the liability to have deaf children. If the parents (or one of them) are congenitally deaf, there is a greater liability to the production of deaf offspring than if they (or one of them) are adventitiously deaf; further, the liability is greatly increased by consanguineous marriages. With regard to this last-named point Fay says: "It is exceedingly dangerous for a deaf person to marry a blood relative, no matter what the character or degree of the relationship may be, and no matter whether the relative is deaf or hearing, nor whether the deafness of either or both or neither of the parents is congenital, nor whether either or both or neither of them have other deaf relatives." In fact, out of 31 such consanguineous marriages 14, or 45 %, resulted in the birth of deaf offspring; and of the 100 children that resulted from these unions, 30, or 30 %, were deaf.

THE PHYSIOLOGY OF PREGNANCY.

The Determination of Sex.—[As was to have been expected, the researches of Schenck, of Vienna, while not resulting in any practical outcome, have stimulated others in the examination of this exceedingly interesting question, and instructive papers on the subject have appeared during the year.] The Greek physiologist Nicolopoulos¹ bases his theory on the assumption that the ovaries functionate in turn each month, and that one ovary, the right, produces males, and the other, the left, produces girls. His method is to consider the first pregnancy as, in a way, a single menstrual period, and that the ovary on the other side enters on its functions the month after parturition and every alternate month thereafter. Consequently, if a girl is born from the first pregnancy, a boy will be conceived during the month after her birth and during each succeeding alternate month. Unfortunately for this theory, however, Winckel,² of Munich, publishes an observation which is somewhat adverse. At one time he removed the left ovary of a woman of 37 who had already had 5 daughters and 4 sons. After the removal of the left ovary she should, in Nicolopoulos' view, which appears to be only a practical application of Seligson's theory, have been capable of producing only boys; but of 5 subsequent pregnancies the result was 3 girls and 2 boys. [This observation precludes the possibility of even an explanation based upon transposition of the viscera.] J. Griffith Davis³ holds that the **sex depends upon the time of conception**: if it occurs 10 days or longer after menstruation, the child will be a boy; if from 3 days before to 8 days after menstruation, the child will be a girl. The ninth day after menstruation is the neutral period, when either boys or girls may result. Davis states that a woman does not conceive from 15 days after the cessation of the menses until 3 days before an expected period. She relates several cases to support her contention, and regards the idea as a thoroughly practical

¹ Jour. de méd. de Par., Oct. 1, 1899.

² Ibid., May 28, 1899.

³ N. Y. Med. Jour., Feb. 24, 1900.

one. The only condition is the practice of absolute continence for a certain number of days. If a male child is desired, then no intercourse from 3 days before the appearance of menstruation until 10 days after; if a girl is the desired addition to the family, then self-denial should be practised from the eighth day after to the third day before the expected period. [This view is much more rational than that held by Nicolopoulos.] Probably the most scientific exposition of the year is that of A. F. Davenport.¹ He advocates the theory of the origin of sex which is known as the **cross-heredity of sex**; that is, that "the sex of the child is determined at the moment of conception, and is the opposite to that of whichever parent is at that moment in relatively the more vigorous health." It is a pretty generally acknowledged fact that "the ratio of male to female children at birth varies so slightly in different countries and among different races as almost to constitute a law." The ratio for Europe is placed at about 106 males for 100 females. Upon this the author says: "In striking contrast to this average, preserved regardless of environment throughout the human race as a whole, stands out the disproportion between the sexes often observable in individual families," the cause of which disproportion must exist in the parents. During 12 months' residence in the Rotunda Hospital, Dublin, in 1883, the author began his observations among the poorer Irish families in the slums, who, as he says, "marry young, are rarely sterile, and in the matter of procreating their species take no thought for the morrow." In the majority of such families he found the greatest disparity between the sexes of the children, amounting in some instances to whole families of 10 or more of one sex. Yet, out of between 400 and 500 families observed, a total of 2540 children gave males, 1313; females, 1227—a fairly balanced ratio, singularly near the estimated 106 to 100. He noticed that the family which contained an undue majority of male children possessed also a mother proportionately more vigorous and in better health than her husband, while in the family with an undue majority of female children the father was proportionately superior in vigor and health to his weakly wife. In many families this rule was exceedingly striking; in others, in whom the sexes were more evenly matched, so also were the parents. From this step to the question, Would it not be possible, by exalting the mother's physical vigor or depressing that of the father,—or by a combination of the two methods, just enough to produce a marked preponderance of vigor in the mother's favor,—to induce the conception of boys, and vice versa? was an easy transition. Davenport essayed to prove it first on animals. He records his first experiment, made in 1886, with a pair of fox-terriers which had previously always produced more or less even litters. When he depressed the dog's health by confinement, low diet, etc., and elevated that of the slut by fresh air, exercise, plentiful feeding, and so forth, prior to the lining, the gestation resulted in a litter of 5 dog pups. He repeated the process, reversing the conditions of treatment, with the result that the next coupling pro-

¹ Intercol. Med. Jour. of Australasia, Oct. 20, 1899.

duced 3 bitches and 1 dog. Davenport's views in this matter are supported by the practice of a "station" manager in New South Wales, who, when desiring to perpetuate any strain of cattle and requiring to produce a heifer for that purpose, stall-feeds the bull and turns the cow out to grass prior to service, and reverses the treatment if a bull calf is desired. The author next put his plan into operation in the human family, and records several instances. On the whole, he has had 45 cases in 12 years. In 6 instances treatment was futile, and was not persevered in on account of organic disease, phthisis, cancer, marked chronic nephritis, etc. Of the remaining 39 families, all were picked examples for the application of his methods; each family contained an undue proportion of either male or female children, and in every instance he found the same conditions existing in a more or less marked degree: viz., the majority of male children possessed a proportionately more healthy mother, the majority of female children a proportionately more healthy father. The results were 32 successes and 7 failures; but in 4 of the failures no pregnancy could be induced, and of the 3 others the author says that the measures were undertaken in so half-hearted a manner that he was not surprised at failure. The following is the author's *modus operandi*: He first makes a careful examination of both parents with a view to treating and eliminating any habit, disease, functional disorder, or pathologic defect that might have any bearing on the health of the weaker parent. Sexual intercourse is next forbidden for one month, and both parents are placed under treatment to build up and elevate the health of the previously inferior parent, and to depress the general tone and health of the previously superior. The first object he achieves: (a) By a suitable régime of stimulating diet especially adapted to the constitution to be dealt with, and varying, of course, considerably in different cases; (b) by insisting on regular hours for sleep, exercise in the open air, and sunshine; (c) by a course of tonic and stimulating drugs; (d) by means of the many other ways known to all and used for building up the general tone of the system—viz., change of air if necessary, cessation from overstrain in mental or physical work, etc. The latter object the author obtains by (a) recommending a course of low diet into which nonnitrogenous elements largely enter; (b) by ordering a maximum of sedentary and brain work with a minimum allowance of sleep; (c) by a course of nerve sedatives, bromids, iodids, etc., for the latter half of the month. The month having expired, intercourse is permitted on the third day after the cessation of menstruation. If pregnancy ensues, all further treatment is unnecessary, the author believing that the sex is determined at the instant of conception. The depression of the stronger parent is entirely temporary, and disappears on the resumption of the ordinary mode of life.

As to the theories of others, the author points out that Girou's theory, propounded in 1823, that the offspring follows the more vigorous parent, would ultimately result in "the establishment of a colony of males." Cross-heredity tends, however, to the maintenance of periodically recurring equilibrium. Hofacker's and Sadler's law, promulgated

between 1828 and 1830, that "the sex of the child depends upon that of the parent whose age is in excess of that of the other," simply, according to Dr. Davenport's contention, resolves itself into cross-heredity, inasmuch as advanced age means, other things being equal, lesser "expectation of life." The well-known fact of the preponderance of male births after a war the author attributes to the exhaustions and anxieties of warfare having depressed the male population and so placed the women in the stronger position, whence they produce male children. Finally, Schenck stated in 1898 that the urine of women bearing only female children invariably contained a larger or smaller quantity of sugar. On this the author asks, "Is not the glycosuric mother the less healthy parent?" and Schenck's rule, therefore, only one possible factor out of the more general and broader law of cross-heredity? [The paper of Davenport shows careful and conscientious research and an earnest desire to attain the object in view. His theory, moreover, is one easy of application, and therefore more readily tested than are the other theories which have been advanced. It is probable that before long the results of other investigations following the line laid down by him will be forthcoming, whereby a more positive view as to the soundness of the theory will be obtained. It must be recognized, however, that this is but a modification of Stackweather's theory "that the sex is determined by the superior parent."]

The Influence of Maternal Inebriety on the Offspring.—This important economic subject has been investigated by Nicloux,¹ Barbier,² and W. C. Sullivan.³ Nicloux has experimented upon animals, and has also caused women at about the time of labor to drink spirits, the blood from the cord being then tested after delivery. An elaborate apparatus and technic are naturally required for distillation of the blood, etc. As the experiments upon human beings possess greater interest, it may be stated that a woman in labor (one hour before delivery) was given a milk-punch, containing rum, representing a definite amount of absolute alcohol. After delivery, 43 cc. of blood were recovered from the umbilical cord, and of this amount about one-fiftieth of 1% was shown by distillation to consist of alcohol. The experiment was repeated a number of times, and in some cases double the above-named amount of alcohol was recovered. Nicloux concludes that in intemperate women enough alcohol would reach the fetal circulation to produce a chronic intoxication, or congenital alcoholism, as expressed in nervous derangements, etc. When it is remembered that these children must also suckle the intemperate mother, and continue to receive alcohol from this source, no surprise should be caused by the degenerate nature of many children of alcoholic mothers. Barbier relates the history of a Parisian family the issue of an alcoholic father and a temperate mother. The children had been conceived while the father was in a state of inebriety. Of 4 living children, none was normal. Some showed arrest of development of one or more fingers; others were rachitic, or did not develop teeth.

¹ L'Obstétrique, Mar. 15, 1900.

² Jour. de Praticiens, July 13, 1899.

³ Jour. Ment. Sc., XLV, 489, July, 1891.

There were no stigmata of syphilis. [The investigations of Fere into the influence of alcoholism on the development of the embryo and in the production of monstrosities would appear to receive some support from Barbier's cases.] Sullivan has investigated the history of the offspring of chronic drunkards (women in the Liverpool prison), and has tried to eliminate the cases in which the alcoholism was complicated by other degenerative factors. Among the many interesting points which the inquiry brought out were the following: The death-rate among the infants of the inebriate mothers was nearly $2\frac{1}{2}$ times that among the infants of sober women of the same stock. In the alcoholic family there is a decrease of vitality in the successive children; for instance, in one family the 3 first-born children were healthy, the fourth was of defective intelligence, the fifth was an epileptic idiot, the sixth was dead-born, and the seventh pregnancy ended in an abortion. There was a sensibly higher death-rate in cases in which the maternal inebriety was developed at an early period. Sober paternity had little influence, and in face of maternal drunkenness might be almost neglected as far as the vitality of the offspring is concerned. Conception in drunkenness had a distinct influence, as was shown by the fact that of the 7 cases in which the condition was noted, in 6 the children died in convulsions in the first months of life, and in the seventh case the infant was still-born. On the other hand, imprisonment during pregnancy, if the imprisonment began early in the pregnancy and lasted nearly all the time, seemed to diminish the evil effects; but the difficulties in drawing conclusions regarding this point were great. Of the children of drunken mothers that survived beyond their infancy, 4.1 % (a very high percentage) became epileptic (9 out of 219). These results show the danger to the community of the female drunkard. [The foregoing reports appear to be free from the extravagant overstatement so often resorted to by extremists on the alcoholic question, and to a deliberate reader would indicate the immense amount of harm resulting to a community from the procreation of alcoholic degenerates. They would appear a strong proof of the necessity of some form of legislation to prevent this additional source of racial degeneracy.]

The Nervous Physiology of the Uterus.—Keiffer¹ calls attention to the fact that the uterus is able, after a manner, to functionate independently because it possesses an automotor power similar to that of the heart. There exists in the uterus a very complete nervous system, which can be clearly demonstrated by Golgi's method of staining. These nervous elements consist in a plexus composed of cells having a large number of prolongations. The plexus is distributed uniformly along the vessels upon which the nerves exercise a very marked action. The anastomoses of the system of cells and their prolongation is accomplished partly by continuity and partly by contiguity. The fibers are divided into sensory, motor, secretory, and glandular. There exists, therefore, in the uterus a ganglionic system formed of nests of cells which play a leading rôle in uterine pathology. It is owing to their independent

¹ *Gaz. hebdom. de méd. et de chir.*, No. 45, June 7, 1900.

nutrition that the uterus exhibits a true autonomy which answers the accomplishment of parturition.

The Influence of Rest or Work upon the Development of the Fetus in Utero.—Bachimont¹ gives the result of his observations regarding the effect which rest or active labor has upon the fetus *in utero*. His general conclusions are that the weight of a child born after the mother has had 2 or 3 months' quiet and freedom from toil is at least 340 gm. greater than the weight of a child born of a mother who has worked actively up to the time of labor. The writer made an investigation in 225 cases of twin-pregnancy occurring at the Baudelocque Clinic in Paris with reference to the point in question. He found that 112 of these patients had rest during the latter part of pregnancy, while 49 had not. In 53 no history was given, and in 11 some pathologic condition complicated the pregnancy. Among those cases in which the mother had rest there was but one child still-born. The majority of the children distinctly exceeded in weight the average child. Among the 104 children in whose case no history of rest was obtainable, 7 were still-born, showing a great increase of mortality over the first group of cases. A further study of these cases shows that the women who had opportunities for rest before labor had a longer pregnancy than those who had not. Thus, their average duration of gestation was 269 days, while in the case of the others it was 247 days.

Urinary Toxicity in Pregnant Women.—Labadie-Lagrave² and others state that heretofore the association of urinary toxicity with pregnancy has had reference only to eclampsia; and, that, therefore, there should be instituted a special study of the intoxicating properties of the urine of the pregnant woman without special reference to eclampsia or any other single condition. [It should be stated that studies of general scope have been made in this direction for the later months of pregnancy.] The present authors have studied the matter from the beginning of gestation, with a view to determining when the urine becomes toxic. With regard to the first 6 weeks after impregnation, or, rather, after the last menstrual period, the normal toxicity undergoes a diminution instead of an increase [which might theoretically have been anticipated]; it would appear, then, that this diminution of toxicity may serve as an early sign of pregnancy. If a suspected case of pregnancy exhibits normal toxicity, we may, therefore, reckon upon the existence of hepatic insufficiency, provided pregnancy is actually present. If, however, the urinary toxicity is diminished, we can not at once conclude that the woman is pregnant, since this diminution of toxicity is also present in chlorosis, hysteria, and tuberculosis. A chlorotic subject undergoes rapid recovery of normal toxicity under appropriate treatment; but if such a patient becomes pregnant, the toxicity will not increase under the customary treatment. This is also true of the hysteric and the tuberculous subject. If such patients do not improve under suitable treatment, and have been exposed to impregnation, the failure to regain the

¹ Rev. Prat. d'Obstet. et de Pédiat., 1899, No. 135.

² Arch. gén. de méd., May, 1899.

normal toxicity is readily explained. The authors show by a toxicity-curve that a given patient had her toxicity lowered in the third month, slightly recovered in the fourth, lowered again in the fifth, partly regained in the sixth, and practically unchanged until delivery, the normal toxicity being regained in some 6 weeks after delivery. The authors therefore conclude that normally there should occur a marked lowering of urinary toxicity in pregnancy; and thus whenever this law is violated, there is always a definite reason for it; and that if a pregnant woman has a toxicity equal or superior to normal, we should fear the possible development of eclampsia.

Placental Transmission.—[A comparatively unknown field of intra-uterine physiology is that concerning the relation of the placenta to disease germs and its functions as a fetal protective organ. The clinical data referring to this interesting subject are growing larger, and there have been some interesting communications made during the year.] Dorland¹ remarks that "it is well known that certain diseases that are rampant in the maternal system find ready access into the placental circulation, where they quickly accomplish their work of destruction and terminate the incipient human life. Such are the exanthems, which appear to be especially prejudicial to fetal existence, and, in addition, assume an unwonted virulence in the presence of gestation, whereby their morbidity and mortality are essentially increased. This is equally true of most germ diseases. Two theories have been advanced in explanation of this transmission—namely, the *parasitic* and the *leukocytic*: (a) It would seem, as Rostowzew has indicated, that under the influence of the infection the epithelial coat of the chorionic villi loses impermeability, so that the bacilli pass directly through it. Such a result would lead at once to the suggestion that it is through bacterial action that the placenta surrenders its protective function and permits the osmosis of deleterious substances. The disorganization of the delicate structure of the placental tissue, together with the abolishment of the physiologic function of the placental villousities through the action of bacteria, has recently been clearly demonstrated by Delore, who proves that this process does not partake of the nature of an inflammation, but rather of a myxomatous and fibrous degeneration. As a direct result of these non-inflammatory changes the selective power of the placenta seems to be largely, if not totally, abolished, and germs and their toxins that would otherwise be arrested at the choriodecidual junction are transmitted into the fetal tissues. This evidence indorses the theory of Malvoz that transmission can take place only when there is a destruction of the villous epithelium as a result of some placental lesion. (b) The older *leukocytic* theory at first sight seems equally as plausible as the parasitic, and claims distinguished adherents both in this country and abroad. Grandin, in a paper read before the Medical Society of the State of New York, presents this view in the following well-selected sentences: 'Given an instance when the woman is in health at conception, and for a certain period afterward, and the chances are that the placenta intervening

¹ Am. Gynec. and Obst. J., June, 1900.

between woman and fetus is healthy. Now, let this woman become diseased, and at once the leukocytes in her blood system carry the infection to the intervillous spaces. Here they are met by the barrier against disease established by the healthy placenta. This placenta contains healthy leukocytes with the property of resisting the entrance of diseased germs. The phagocytic action of these healthy leukocytes comes into play, destroys at once the leukocytes bearing disease, and thus the fetus is protected. Given, on the other hand, a woman diseased at the time of conception, or becoming so shortly afterward,—that is to say, at a period when the placenta is in the course of early formation,—then we have at the outset either a diseased placenta or one which becomes diseased as it is forming. Such a placenta contains either no healthy leukocytes, or else they have but feeble resisting powers. The barrier interposed by the placenta is, therefore, ineffective to an absolute degree, or else the leukocytes within it resist feebly, or strongly, according to the intensity of the disease process endeavoring to gain access from the side of the woman. In this latter event disease is transmitted to the fetus, because the disease-bearing leukocytes from the side of the woman are stronger than and overcome the leukocytes in the placenta.' ”

Penot ¹ has collected a series of statistics concerning **typhoid fever in pregnancy**. That pregnancy offers no immunity is the first deduction due to the author's investigations ; secondly, it would seem that the prognosis is not so grave as has generally been supposed. Abortion takes place in a considerable number of cases, the writer finding an average of 65 %. On the other hand, this is not so high a proportion as in cases of pneumonia, smallpox, and scarlatina. It seems that the particular characteristics of the attack, according as it is slight or severe, have considerable influence on the probability of abortion ; also the period of pregnancy at which typhoid supervenes, abortion apparently taking place during the first 6 months, but more especially during the third, fourth, and fifth. Certain epidemics seem to be more prejudicial to pregnant women than others. Pregnancy itself does not seem to render the prognosis of the typhoid fever any worse, the mortality being very much the same in cases of pregnancy and nonpregnancy. Generally speaking, abortion is followed by considerable improvement in the general symptoms, provided the case is not unduly severe. When, however, it takes place in very adynamic conditions, the results may be grave ; sometimes there is metrorrhagia, rigor, and collapse. From the point of view of treatment, pregnancy does not seem to enter into consideration, the only point being that, should the patient be under cold-bath treatment, the latter had better be suspended for a few days should the patient have aborted.

Charrin, Lavaditi, and Paris ² report a case of predisposition to **streptococcic infection in the new-born**, the salient features of which were a woman in an advanced stage of cancerous cachexia giving birth to

¹ Thèse de Paris, 1899.

² Compt. rend. de la Soc. de Biol., 9th ser., vol. 1, p. 301, May 5, 1899.

an infant that had a persistent subnormal temperature, lost weight continuously, and died when about 6 weeks old; the cause of death was found to be general streptococcic infection. The mother was 40 years of age; a year previously she had had a cancer removed from the breast, and this had returned during the course of her fourth pregnancy. Her 3 previous gestations had been normal. The infant weighed at the time of birth only 2300 gm., and measured 43 cm. in length. The infant's temperature oscillated between 33° C. and 35.8° C., rising a little when an eruption of vesicles and pustules appeared on the face and neck, and falling to 27.8° C. the evening before death took place. The daily loss in weight was from 14 to 16 gm., and on the day of death the infant weighed only 1680 gm.—a total loss of 620 gm. At the autopsy no lesions were observed by the naked eye, but there was a distinct loss in weight in several of the organs, especially of the liver. The hepatic capillaries showed under the microscope marked dilation, and at places they had given way, forming small hemorrhagic foci. Further, nearly all the capillaries were full of streptococci, and here and there they invaded the intercellular spaces. The kidney was less profoundly altered, but the tubular epithelium showed numerous streptococci. In other organs the vessels contained also the streptococcus, and the condition was, therefore, one of general streptococcic infection with special localization in the liver. [Here it may be supposed that the body-cells of the offspring of a mother markedly cachectic were in a defective state, and that this led to hypothermia. This, in its turn, diminished the powers of resistance of the organism against germs by rendering the phagocytes more torpid and the secretions less bactericidal, by lessening the alkalinity of the plasma and leading to the accumulation of acids in excess. In some such way the soil was prepared for the microbic invasion.]

Béclère, Chambon, Ménard, and Coulomb¹ communicated to the Académie des Sciences of Paris the results of experiments on the **transmission of vaccinal immunity through the placenta**. The researches were carried out upon 65 women and 65 new-born infants at the Maternité de l'hôpital Saint-Antoine under the charge of Bar. At the birth of each infant some blood was obtained from the maternal uterus and from the placental end of the umbilical cord, and in the serums from these, 2 parts of vaccine of known virulence were immersed for 48 hours. Then 2 small quantities of the vaccine thus treated, along with a part which had simply been immersed in normal saline solution, were inoculated below the skin of a heifer, 60 of the latter being employed. Seven days later the examination of the 3 groups of eruptions permitted the determination of the presence or absence in the serums in question of an antivirulent action upon the vaccine; and when this action was manifest, it permitted the antivirulent power of the two serums to be compared and measured. Each infant on the day of birth was inoculated on the arm with vaccine of known virulence, and the mother was inoculated at the same time with the same vaccine; 7 days later the results in both were noted and compared with the antivirulent power of the two serums. All

¹ France méd., An. XLVI, p. 486, Aug. 4, 1899.

the mothers had been previously vaccinated—some during the pregnancy, some at a date anterior to it. The results of these ingenious experiments were as follows: Immunity with regard to vaccinal inoculation was observed only in those new-born infants whose mothers had themselves this immunity. The intra-uterine transmission of vaccinal immunity was not observed in all the women who possessed this immunity at the time of labor, but only in a small number of them; it was observed exclusively among the women whose blood (antivirulent with regard to the vaccine) had transmitted through the placenta its antivirulent properties to the blood of the fetus. The intra-uterine transmission of vaccinal immunity may be observed among women whose serum is antivirulent, whether they were vaccinated during or at any date before the pregnancy; on the contrary, it was not observed in women whose serum was not antivirulent, although they had been vaccinated during or before the pregnancy, even if only a few weeks previously. The passage, therefore, of the antivirulent substance from the maternal blood through the placenta to the fetal blood was a necessary condition of congenital immunity. This necessary condition, however, was not sufficient, for among the new-born infants whose serum was antivirulent there were some who could be inoculated with success. In new-born infants with antivirulent serum the great or little antivirulent power was an important factor in the success or failure of vaccinal inoculations. Generally speaking, the more antivirulent the serum, the greater the chance of failure of vaccinal inoculation practised after birth.

Auché and Chambrelent¹ have met a new and completely proved case of **congenital tuberculosis**. This makes 20 cases in all in which the proof has consisted in the discovery of the tubercle bacillus of Koch in the histologic lesions of tubercle, or in the results of inoculations into animals done with aseptic precautions, or in both these tests combined. The reported cases in which such proof was not forthcoming must be excluded from the list of established instances of congenital tubercle. Of the 20 cases, 8, including the present observation, showed distinct tuberculous lesions, while 12 did not. [That such cases are rare must be ascribed to the fact that Koch's bacillus does not live in the blood stream, and that only in exceptional cases, as when the tuberculous process becomes generalized, do the bacilli have a chance of passing through the maternal blood to the placenta, and so to the fetus. When, however, the fetus is reached, it is perfectly clear that its organs are not at all an unfavorable soil for the growth of the bacilli. In structure the lesions of fetal tubercle showed no giant cells, at any rate in the case of Auché and Chambrelent; the center of the tubercle was caseous, and was occupied by epithelial cells. In distribution the bacilli evidently followed the blood stream, passing from the maternal part of the placenta through the vessels of the villi and the umbilical vein to the liver, spleen, and heart of the fetus, and thence to the other organs.]

¹ Arch. de Med. Exper. et d'Anat. Patholog., vol. XL, p. 521, July, 1899.

THE DIAGNOSIS OF PREGNANCY.

An Early Sign of Pregnancy.—R. von Braun-Fernwald¹ refers to the well-appreciated fact that one of the earliest signs of this condition is the change in the consistency of the uterus. A further extension of the distinction he finds to be a difference in the anteroposterior diameter of the uterus—that it is thicker on one side than on the other, and between the two sides there is a central groove. The explanation which he gives of this peculiarity is that the ovum is rarely attached in the central line; as a result, there is a thickening of one or the other lateral horns. He was able to diagnosticate pregnancy by this sign much earlier than by any symptoms that have heretofore been described. His observations were confirmed in a large majority of instances by the subsequent history of the case. He has found the sign to be of value in cases of abortion in which the ovum is expelled; in these cases the central groove and the lateral thickening are absent. On the contrary, if it is not detached, these signs remain. The sign is also of marked value in cases of ectopic gestation in which there are the ordinary signs of pregnancy, but the central groove and the lateral thickening are absent.

An Obstetric Tricyclic Calendar.—W. L. Kantor² submits a calendar (Fig. 48) which has the advantage of being compact, simple, and portable. It should be used as follows: The date of the last menstruation being given, add the numeral on the right hand of the month in which it occurred to the corresponding date of the month immediately following on the same circle, and you obtain the exact day on which labor should take place: *e. g.*, last menstruation, December 17th; labor, September 17th + 6 = September 23d.



Fig. 48.—Obstetric calendar (Kantor, in Phila. Med. Jour., Dec. 30, 1899).

Radiography of the Pregnant Uterus.—[Numerous attempts have been made to secure an outline of the fetus *in utero* by the x-rays. Some years ago Varnier succeeded in obtaining a tracing of the cranium and skeleton of a living child in the womb of its mother in the ninth month of pregnancy. A clear outline, however, was difficult at that time to obtain.] Varnier³ calls attention to his report, made at the Congress in Moscow, and to further experiments upon the cadaver which he has carried on with the x-rays. Dim outlines were obtained upon the living pregnant patient, but no clear picture. Recently, by lengthening the time of exposure Varnier was able to secure an outline of the contour of the fetal head; and also to determine whether or not it

¹ Wien. klin. Woch., Mar. 9, 1899.

² Phila. Med. Jour., Dec. 30, 1899.

³ Ann. de gynéc., April, 1899.

Albert¹ demonstrated his method of obtaining a tracing of the brim of the pelvis and the position of the child by the use of the x-rays. He obtained the best results in examining the superior plane of the pelvis, and was successful in diagnosing flattened pelvis. In one of his cases the patient lay flat upon the back, and in others assumed a partly sitting posture. He was enabled by these means to obtain a measurement of the upper portion of the pelvis, which gave a good indication of its capacity. He called attention to the difficulties arising from the fact that the shadow of the promontory of the sacrum became confused with that of the symphysis; but from 3 to 4 minutes' exposure to the action of the rays was required.

Past Pregnancy Tested by the Microscope.—Opitz² has written on the recognition of past pregnancy through the examination of pieces of the uterine mucosa removed by scraping. As regards what may be reckoned as fetal relics, he classes well-preserved fetal elements, such as chorionic villi, columns of cells with a covering of syncytium, and syncytium buds (placental giant cells), as reliable evidence, and adds serotinal giant cells, which, however, he shows are not always confirmatory of previous pregnancy. As regards the maternal tissues, Opitz includes certain evidence of pregnancy, decidual cells of from 20 to 30 micromillimeters grouped in distinct ways, and also uterine glands as modified by pregnancy; but he insists that many appearances which seem at first sight conclusive are not always reliable. There are fallacies about fragments of uterine glands when signs of repair of tissues are detected on a piece of uterine mucosa; they may indicate previous pregnancy, but the observer must be sure that they do not represent restoration of structures involved in a simple abrasion.

THE HYGIENE OF PREGNANCY.

The Physician's Duties to Pregnant Women before Labor.—E. A. Ayers³ summarizes as follows the chief duties of the physician during the pregnancy of his patient: Patients should be instructed, first, in the cardinal rules of gestation—frequent but never prolonged outdoor exercise and brief rests in the recumbent position, with low-heeled shoes and a shoulder-strap support to the skirts, the corsets being laid aside; a sensible diet that avoids an excess of meats; regulation of the bowels and steadiness in the perspiratory function. The chief cause of unintentional abortion in healthy pregnant is prolonged exercise or over-exertion on the feet, constipation, and, perhaps, coition. The nausea of pregnancy, so usual in primiparæ, aids in many cases, by its restraining influence, the conservation of gestation. Young wives are prone to play bravado during the unshowable first months of pregnancy, and try to do all they did previous to impregnation. Urinary examinations should be made once a month from the third to the seventh month, every two

¹ Centralbl. f. Gynäk., No. 15, 1899.

² Zeit. f. Geburtsh. u. Gynäk., vol. XLII, part I, 1900.

³ N. Y. Med. Jour., Mar. 3, 1900.

weeks from then to the ninth month, and then every week until labor. The most practical method for obtaining a warning of the need of urinary examination is to instruct the patient to give immediate information of any reduction in the amount of urine passed in 24 hours. The examinations should note the 24-hour amount, the specific gravity, the reduction, if any, of urea, and the presence of albumin and casts. Very few cases of eclampsia would occur if proper attention was given to the urine. The question of antepartum examinations is a broad one, but it involves 50 % of the obstetrician's usefulness. If the patient is a primipara, the pelvis should be measured by the twenty-eighth week. We should obtain the diameters of the iliac crests, anterior superior spines, the external and internal diagonal conjugata; and in misshapen pelvis the external obliques, interischial and symphysiococcygeal diameters. Compare these diameters with the height and weight of the patient and of her husband, their ages, and notice the character of the mother's skeleton. A frame of light bones usually has a relatively large pelvic caliber, estimated from the external measurements, and vice versa. In multiparae, when the previous children were of full size at term and the labors normal, these measurements are not required; but a comparison between the size of the fetal head and that of the pelvic cavity should be made a fortnight before labor, since there may be an overgrowth of the fetus. The principal facts to be ascertained by abdominal examinations are: The position of the fetus, twins, fetal vitality, grades of hydramnion, condition of the bladder, tumors in the abdominal cavity, and complications involving the kidneys, liver, heart, lungs, etc. Fetal malposition is frequent in proportion to the amount of amniotic fluid present. Malpositions present at the seventh month, when there is much room for fetal gyrations, do not necessarily persist, since usually with time the fetus daily represents a gain in space occupied compared with the amniotic fluid. But women with malpositions of the fetus should be examined every 2 weeks. External version may be final, if performed when the fetus is getting fixed in malposition. Twins are usually a surprise [but need seldom be so], and often cause dangerous complications in delivery and the confusion incident to the arrival of the unexpected guest. Two heads, two heart-rates, and innumerable extremities are full of valuable diagnostic suggestions. In habitual premature fetal death a weekly record of the fetal pulse should be made from the sixth month of pregnancy. Patients with hydramnion should have the anemia usually accompanying it combated, and should be instructed when labor pains first occur to lie as still as possible in bed until amniotic rupture takes place, in order to avoid prolapsus funis or malpresentation of the fetus. Abdominal tumors may not be noticed by the patient, but should not escape the examiner's eye. At least one vaginal examination should be made a few weeks before labor, with an eye alert for placenta prævia, exostoses, fibroids, ovarian tumors, atresia, pelvic contraction, cancer, vaginitis, etc. The nipples should be examined a month before labor, milk-scabs, abrasions, and fissures treated, and depressed nipples elongated by traction daily.

Diet During Pregnancy as a Preventive of Dystocia and for the Determination of Sex.—E. Preble¹ states that it can scarcely be doubted that in future diet in obstetrics is destined to play a part akin in importance to diet in obesity, diabetes, etc. There are drawbacks to the popularity of both Schenk's and Prochownick's management. The former requires a year to establish its value in a given case, while the cost of the repeated quantitative examinations and the trouble entailed upon the mother tend to limit its sphere to those of the wealthy, who, above all things, desire male issue. Prochownick's diet, insisting, as it does, upon rigid abstention from excess of liquids, becomes a hardship on the pregnant female who is accustomed to yield to the slightest craving in dietetic matters; and has, besides, to compete with many rival plans of treatment for dystocic conditions, especially symphysiotomy, which operation has been revived since Prochownick first set forth the principles of his diet. Despite these drawbacks, he has little doubt that the question of diet in obstetrics will shortly discover its proper field of usefulness. In contracted pelvis and other conditions in which it is desired to keep down the size of the fetus, Fenwick² advocates rigid dieting, with restriction of starches, sugars, and fluids. The following is an example of the dietary followed: For breakfast, a small cup of tea or coffee, an egg, and 2 slices of toast. For lunch, any kind of meat, game, or fish; green vegetables; 1 slice of toast or a dry biscuit; cheese; 1 wineglassful of wine, milk, or any other fluid, except malt liquors. At afternoon tea, a small cupful of tea or coffee, with 1 slice of bread and butter, or cake. For dinner, the same as for luncheon.

PATHOLOGY OF THE FETUS AND OF THE FETAL APPENDAGES.

The Antenatal and Intranatal Factor in Neonatal Pathology.—[The profession is greatly indebted to J. W. Ballantyne for his invaluable researches in fetal pathology, a realm of medicine which he has made peculiarly his own. As a leading editorial³ has happily stated, a falling birth-rate and an increasing interest in antenatal pathology are matters which have come together, not quite fortuitously, at the dawn of a new century. Both are likely to play a not inconsiderable part in the immediate future with bearings that are no longer recondite, but very practical and of economic and national importance. The causes of the falling birth-rate are fairly well understood, and the remedy for one of the most important of them is within easy reach when the national conscience shall have been awakened. Herein is the connection between the diminishing birth-rate and the increasing interest in antenatal pathology. *If the fetuses are to be few, let them at least be fine.* Antenatal pathology being the subject which deals with fetal diseases, embryonic deformities, and germinal predisposition to disease and deformity, it must play an important part in any attempt to insure ante-

¹ Obstetrics, May, 1899.

² Med. Times and Hosp. Gaz., Sept. 16, 1899.

³ Brit. Med. Jour., June 23, 1900.

natal hygiene.] Ballantyne¹ gives the following summary to his interesting article on the antenatal and intranatal factors in neonatal pathology: It is clearly evident that if the characteristics of the diseases of the new-born infant are to be understood, it is essential that account be taken not only of the fact that the infant's organism has just passed through a period of traumatism and is passing through one of readjustment to meet new requirements, but also that during the 9 months of intra-uterine life which precede birth it may have been the sphere of morbid processes which have left their impression on it. It may come into the extra-uterine environment already diseased or malformed, or predisposed to some pathologic development. Like pregnancy, neonatal life is an epoch which has a physiology in many respects peculiar to itself, and which borders very closely on the pathologic, tending very easily to pass over into it. In a certain sense the ordinary vomiting of pregnancy is to the uncontrollable form as the ordinary "physiologic" jaundice of the new-born is to pernicious icterus neonatorum. Further, just as every woman brings with her into her pregnancy the results of her past pathologic history, so the new-born infant brings with him, out of his antenatal life into his neonatal existence, the effects of any morbid processes which may have attacked him *in utero*. In this way the pathology of pregnancy and the maladies of the new-born infant are both invested with peculiarities. The peculiarities, therefore, of neonatal diseases are not inexplicable, but are the direct outcome of the action of the antenatal and intranatal factors on the organism at this period of life.

Antenatal Therapeutics.—J. W. Ballantyne² gives a good survey of the situation in the way of the possibilities of antenatal therapeutics. He thinks that the fetus is liable to pathologic conditions as wide almost as those of the adult. The phenomena of antenatal pathology are of many kinds—sterility, single and double monstrosities, abortions, stillbirths, mortinatality, twinning, fetal diseases, many tumors, congenital debility, tendencies involving heredity and leading to the later development of tuberculosis, rheumatism, and a great many neuropathic disorders. The possibilities of antenatal therapeutics are great. Antenatal therapeutics may be divided into the treatment of the fetus before birth, during birth, and after birth. It is in the domain of surgery that postnatal treatment of antenatal morbid states has secured the most trustworthy triumphs. In this group are included club-foot; cleft palate; harelip; phimosis; imperforate hymen and anus; congenital dislocation of the hip, shoulder, or knee; torticollis; spina bifida; congenital fistulæ, cyst, and tumors of various regions; umbilical or other hernia; extroversion of the bladder; atresia of the vagina, urethra, or vulva; epispadias, hypospadias, and nondescent of the testis; vulvar anus and supernumerary digits; syndactylism; congenital absence of the fibula, tibia, or radius, etc. In the repair of many of these deformities surgery has been very successful, but in some conditions, such as extroversion of the bladder, congenital absence of bones, etc., efforts in the direction of

¹ Jour. Am. Med. Assoc., Nov. 18, 1899.

² Brit. Med. Jour., June 23, 1900.

repair have been mostly barren of good results. In the direction of medicinal treatment of some of the affections of the antenatal period, some good results have been obtained; for instance, in feeding thyroid extract in cretinism, and the administration of mercury for syphilitic conditions. Wonderful results have been obtained in the treatment of congenital nervous affections, such as medically regulated educational training of those congenitally blind, deaf and dumb, or idiotic. In one direction the treatment of idiocy has not been altogether encouraging: *i. e.*, the performance of craniectomy for microcephalic idiocy. The operation is sometimes followed by improvement up to a certain point, when all that is gained is as steadily lost. Intranatal therapeutics is mainly preventive in its character, and naturally falls into the hands of the obstetrician. By the registration of still-births much might be gained by the profession, for in that way dissections would be made and much might be learned for future guidance. Antenatal treatment—*i. e.*, intra-uterine—mainly consists in bringing medicinal and hygienic influences to bear upon the embryo and fetus while still *in utero*. Of course, it is absolutely necessary that these shall act first upon the mother; antenatal treatment is primarily maternal. It is in syphilis that antenatal therapeutic measures are especially efficacious. In malaria, also, much is gained by the administration of quinin, although the likelihood of producing a miscarriage or an abortion by giving cinchona or its derivatives to the pregnant woman must be remembered. Potassium chlorate is good to prevent the occurrence of abortion, as has been proved in the experience of Simpson and Lawson Tait.

Malignant Deciduoma.—W. J. Smyley¹ states that observers are now almost unanimous in believing that this is a disease sufficiently distinct to merit separate consideration. They also agree as to its clinical features, pathologic appearance, and treatment; also as to its connection with pregnancy, and differ only as to their views concerning its histogenesis. He inclines to Veit's opinion that the disease is a sarcoma, modified by pregnancy. He also describes a case which has come under his own observation. F. W. N. Haultain² describes a case occurring in his practice and gives a comprehensive and valuable report of the microscopic examination. He saw the case for copious uterine hemorrhage after a period of 10 weeks' amenorrhea. The hemorrhage was so severe that the cervix was dilated and the contents (a myxomatous mole) naturally expelled. A month later the hemorrhage recurred, and a "large fibrinous mass, like a carneous mole," was thrown off. Free curetting was resorted to, and the author was struck by the free hemorrhage, which required intra-uterine plugging. The scrapings, when examined microscopically, showed "the characteristic multinucleated protoplasmic masses and large nucleated cells described as occurring in deciduoma malignum," and hysterectomy was urged upon the patient, but was refused at the time. Subsequently hemorrhage of a very severe type set in, and the uterus was removed *per vaginam*. The ovaries and tubes were left. The patient made a good recovery and was well 8 months

¹ Lancet, Jan. 27, 1900.

² Med. Press and Circular, July 12, 1899.

after operation. An examination of the uterus after removal showed that on section there was "a small growth" the size of a walnut arising "from the upper part of the anterior uterine wall, sessile in nature, and bulging into the uterine cavity. On a complete section of the tumor the portion which bulged into the uterine cavity appeared to be composed mainly of fibrinous material, which indefinitely and irregularly gave way to a gray, apparently cellular layer, which in turn encroached upon the substance of the uterine wall in an equally indefinite and irregular manner by means of prolongations along the blood sinuses." The infiltration was apparently not extensive, and a large area of healthy tissue remained between the growth and the peritoneal surface. On microscopic examination the tumor was found to be composed of blood-clot, two varieties of cellular elements, and chorionic villi. "The cellular elements were of two types: (1) large polyhedral cells, which stained lightly, and whose large nuclei showed a wide intranuclear network; and (2) multinucleated, deeply staining protoplasmic masses of all varieties of shape, which were extremely rich in chromatin and showed no wide intranuclear network as in the other cells. Both varieties of elements, however, showed a marked tendency to retraction of their protoplasm and vacuolation. Mitotic figures were frequently observed in the individual cells, but nowhere in the protoplasmic masses. The relationship of these two types of cells varied greatly; in some instances it appeared as if groups of individual cells were confined in alveoli formed by processes of nucleated protoplasm. This is most apparent when in close relationship with the chorionic villi. As one proceeded further from the villi the cells and protoplasmic masses were arranged indefinitely." The remaining microscopic features were much as usually occur in such cases. In order to investigate further the origin of the so-called deciduomas, the structure of a myxomatous chorion should be considered. The importance of this is shown by the fact that of 91 cases recorded, 49 followed expulsion of that variety of mole. Myxoma of the chorion is rare, and occurs only once in 1800 pregnancies. A connection may possibly be found between the normal villus of the young placenta and the disease now under consideration.

Cystic Degeneration of the Chorion.—The papers of Berry Hart and Herbert Williamson¹ are valuable contributions to the literature of hydatidiform mole. Hart's paper dwelt on the cause of the differentiation of connective tissue in the human fetus with reference to the essential nature of the hydatid mole. He first discussed the development of connective tissue, especially in the myxomatous stage and on to the fully developed type. He pointed out that the myxomatous stage was permanent for the umbilical cord; that the tissue in the villi fell short of fully developed connective tissue, while that in the rest of the fetus went on ultimately to the higher forms. He believed that the relations of the thyroid to myxedema in the adult, as well as the structure and the evidence of activity of the thyroid in the fetus, made it highly probable that Sir F. Semon's theory was applicable in fetal life, that, in fact, the

¹ Lancet, 1899.

thyroid secretion favored the development of connective tissue from the myxomatous to the higher type. He pointed out that the umbilical cord was not vascularized; that the thyroid secretion did not affect it, and thus it remained of a mucous type. He applied the same reasoning to explain the condition of the connective tissue in the villi and in the vitreous humor. He summed up as follows: (1) There is anatomic and clinical, but not as yet experimental, evidence that the thyroid is functionally active in the human embryo. (2) It begins to develop in the fetuses of 4 mm.—that is, about the third week. (3) It probably causes the development of connective tissue to pass from the myxomatous to a higher stage; thus (*a*) the cord, without vessels, and presumably without thyroidization, remains myxomatous; (*b*) the adult vitreous, under the same conditions, remains allied to myxomatous tissue; (*c*) tissues like the villi are also more or less myxomatous according to their age and length of exposure to vascularization. (4) The free covering of somatopleure is also probably affected by the thyroid. (5) The hydatid mole may be regarded as acute myxedema of the chorion. (6) Thyroid extract should be administered after hydatid mole abortion. In the hydatid mole there is a mass of tissue of a myxomatous type, with, in almost every case, no fetus. He believed, therefore, from the evidence he had brought forward, that this view of the myxedematous nature of the chorion was a highly probable one. Williamson's paper touched on the pathology and symptoms of hydatidiform cyst. He described the development of the chorionic villi and the changes which occurred in them when undergoing myxomatous degeneration; the changes as observed by himself agreeing almost entirely with those previously described by other observers. The "myxoma fibrosum" of Virchow was described, and Williamson gave his reasons for regarding this condition as closely allied with hydatidiform mole. The question of the priority of the degeneration of the chorion or the death of the embryo was discussed, and the conclusion was arrived at that degeneration of the chorion usually preceded the death of the embryo. The relation of hydatid moles and deciduoma malignum was discussed. Williamson gave reasons for doubting the doctrine of Spiegelberg with regard to the fetal origin of the hydatidiform disease, and quoted cases of repeated hydatidiform molar pregnancies occurring in the same woman. The usual naked-eye appearances of the mole were described. He then endeavored to ascertain (1) the frequency of the occurrence of the condition and (2) the effects of (*a*) age, (*b*) multiparity, and (*c*) rapid child-bearing upon its production; concluding that (1) its approximate frequency might be once in 2400 pregnancies; (2) that hydatidiform pregnancy might occur at any time during the child-bearing period, the age of the woman having very little influence; (3) that the condition was more frequent in those who had borne few children than in those who had borne many; and (4) that it was not the rule for previous pregnancies to have followed upon one another with great rapidity. An inquiry was then made into the presence or absence of the usual signs and symptoms of normal pregnancy under the following heads: (1)

Amenorrhea; (2) vomiting; (3) activity of the breasts; (4) blue coloration of the vaginal mucous membrane; (5) softening of the cervix; (6) uterine tumor; and (7) uterine souffle and fetal heart-sounds. The conclusion was that all these symptoms and signs were usually present except the uterine souffle and fetal heart-sounds, but sometimes these might be heard; while, on the other hand, the only sign which was constantly present was enlargement of the uterus. The distinguishing features of the condition were then described under the following heads: (1) The size and other physical characteristics of the uterus. Two classes of cases were shown to exist—(a) those in which the uterus was larger than would be expected from the probable duration of the pregnancy, and (b) those in which the uterus was smaller. Another feature sometimes present, and of importance, was uterine tenderness. (2) Vaginal discharges, with or without the cysts. (3) Hemorrhage. Williamson then discussed the diagnosis, the conditions likely to be mistaken for hydatidiform mole being: (1) concealed accidental hemorrhage and placenta prævia; (2) the discharge of a pelvic hydatid through the vagina; and (3) hydramnion, especially if combined with hydrorrhœa gravidarum. Cases in which difficulty had arisen were recorded. The complications met with were described: (1) Albuminuria, a frequent complication. Two forms were to be distinguished: (a) One form in which the prognosis was good, and in which blood and epithelial casts were not present in the urine; and (b) one form in which the prognosis was bad, and in which these structures were found in the urine. (2) Hemorrhage, seldom fatal in itself. (3) Sepsis, sapremia, septicemia, and pyemia were all frequent complications. With regard to prognosis, the mortality of 25 cases was 20%. The mortality of 10 consecutive cases from St. Bartholomew's Hospital was 30%. In discussion Doran called attention to the frequency of uncontrollable vomiting in association with hydatidiform mole; cases illustrating this had also been published by Brindeau and Bué. Keiffer traced vesicular mole to proliferating arteritis, which modified the development of the products of conception; this pathologic change he attributed to the abuse of emmenagoges early in pregnancy. Neumann, Marchand, and Ludwig Fraenkel brought forward strong evidence that deciduoma developed from relics of hydatidiform mole. Marchand was also a strong supporter of the molar theory as to the origin of deciduoma, dissenting from the opinion freely expressed at a meeting of the Obstetrical Society in 1896, and since then supported by Veit.

Permanent Separation of the Amnion and Chorion in the Mature Afterbirth, Forming Double Fetal Sacs.—J. B. Nichols¹ states that in the early period of pregnancy the amnion and chorion are separate membranes and inclose separate (concentric) cavities, the amniotic and chorionic. Later, about the third month, the amnion becomes closely adherent to the chorion, and the two membranes grow together, obliterating the chorionic space. It rarely happens that the primitive separation of the amnion and chorion persists throughout pregnancy, so

¹ Med. News, July 1, 1899.

that the fetus is enveloped in two separate sacs, the amnion internally and the chorion (united to the decidua) externally. In April, 1899, he obtained for microscopic purposes, through the kindness of W. G. Suter, a human placenta with membranes and cord. The afterbirth was fully matured, and from a normal labor at full term; unfortunately, further details of the maternal history could not, when later sought for, be ascertained. On examination this afterbirth was found to exhibit the abnormality of having the amnion entirely separate from the chorion, so that the fetus was surrounded by two separate sacs. The outer sac corresponded to the ordinary fetal membranes, proceeding from the margin of the placenta about the fetus; microscopic examination showed this to consist of the chorion and decidua vera, the amnion, which is ordinarily attached to the inner surface of the chorion, being missing. The inner sac was, as shown by the microscope, the amnion; it was given off from the placenta immediately around the insertion of the umbilical cord, and was thence reflected over the cord and fetus. A broad interval separated the amnion and chorion, and the surface of the placenta was not covered by amnion. [In such cases of double fetal sacs two separate discharges of the water may occur, giving rise to a form of hydrorrhœa gravidarum, or what was formerly known as "false waters." The condition under consideration is a rare anomaly of the afterbirth, and one that is not specifically mentioned in standard works on obstetrics. Seven other cases of this abnormality are on record.] Auvard¹ explains the **separation of the amnion and the chorion** in the following way: During labor the chorion partly ruptures at the uterine orifice, and the pocket of waters formed by the amniotic membrane is forced through the ruptured chorion, forming a hernia. Drawn down and contracted by this hernia, the amnion is peeled off from the chorion; and if this peeling off continues long enough, the membranes are completely separated one from the other.

Infarcts of the Placenta.—J. W. Williams,² in a paper on "The Frequency and Significance of Infarcts of the Placenta, Based upon the Microscopic Examination of 500 Placentas," gives the result of a thorough study of the subject, illustrated by a series of fine plates. His conclusions are as follows: (1) Infarcts measuring at least 1 cm. in diameter were observed in 315 out of 500 consecutive placentas (63%). (2) Smaller infarcts, many just visible to the unaided eye, were observed in the great majority of placentas, while microscopic examination revealed early stages of infarct-formation in every full-term placenta which he examined. (3) The primary cause of infarct-formation in the great majority of cases is to be found in an endarteritis of the vessels of the chorionic villi. (4) The primary result of the endarteritis is coagulation necrosis of portions of the villi just beneath the syncytium, with the subsequent formation of canalized fibrin [as the process becomes more marked, the syncytium likewise degenerates, and is converted into canalized fibrin, which is followed by coagulation of the blood in the intervillous spaces, resulting in a matting together of larger or smaller groups of villi by means

¹ Med. News, Aug. 5, 1899.

² Phila. Med. Jour., June 30, 1900.

of fibrin]. (5) The part played by the decidua in the production of infarcts has been greatly overestimated by many observers; it is more than probable, in many cases at least, that the tissue which they designate as decidual is really fetal ectoderm. (6) Moderate degrees of infarct-formation are not pathologic, exert no influence upon the mother or fetus, and are to be regarded as a sign of senility of the placenta, analogous to the changes which take place in the villi of the chorion at an earlier period. (7) Marked infarct-formation is not infrequently observed, and often results in the death or imperfect development of the fetus. It is usually associated with albuminuria on the part of the mother, though at present we can not account satisfactorily for the relationship between them. (8) Infarct-formation is not particularly marked in cases of eclampsia, being usually observed only in those cases which were preceded by marked albuminuric symptoms. (9) There is no evidence in favor of the bacterial origin of infarcts.

Maternal Impressions.—Ogle¹ and Landau² discuss the philosophy of this puzzling subject. Both cite numerous well-authenticated instances in which the birth-mark or deformity of the child suggests more or less forcibly some fright or accident which occurred to the mother during her pregnancy. Both admit that it is difficult to explain the very wide-spread belief in maternal impressions which has existed from the earliest times in every country. Ogle says that it is hard to imagine how a mental impression of the mother can affect the development of a portion of the child, in the absence of any direct nerve-connection between the two; but he apparently hesitates to set down as pure superstition or error of observation all the recorded cases of maternal impressions from Aristotle to the present time. Landau is more outspoken, for in the closing words of his article he says: "I admit that it is striking that earnest thinkers of great power of observation, wide learning, and sharp intellect bring forward certain cases which seem to uphold the primitive belief. Still, great men have made mistakes before now. Maternal impression is and remains a superstition, and despite Welsenburg's highly instructive work on the subject, it has not become worthy of scientific recognition." H. F. Lewis³ leans strongly to the view that monstrosities are not due to maternal impressions, but are due to anomalies of development in the ovum, which are not in any way influenced by the mental condition of the mother. If, he maintains, maternal impressions explain human anomalies, they should also explain such occurrence among the lower animals and even among plants. Monsters are even more common among domestic animals and fowls than among men. They are even relatively common among reptiles, fishes, and insects, not to speak of nuts, oranges, and corncobs. The strongest blow is dealt to the theory of maternal impressions by the results of experiments in the production of monsters artificially. Numerous experiments have been performed upon eggs, fishes, and insects, which have resulted in the production of almost all the typical varieties of monsters. Dif-

¹ Charlotte Med. Jour., May, 1899.

² Monatsch. f. Geburtsh. u. Gynäk., May, 1899. ³ Am. Jour. Obst., July, 1899.

ferent varieties can even be produced at the will of the experimenter. In human fetuses, even at full term, there are sometimes found remains of amniotic bands and adhesions which obviously, by interfering with development of different parts at an early period of gestation, were the causes of various malformations. In short, all malformations in monsters can be explained by purely physical and mechanical causes, entirely remote from psychic influences. J. G. Kiernan¹ remarks that maternal impressions have been hitherto considered from one standpoint only, and that is their supposed cause and its mode of action. Spitzka, who was a staunch disbeliever in the popular theory of maternal impressions, declared that his skepticism had been shaken by a recent demonstration of specimens of "newly hatched chickens with a curved beak like a parrot and the toe set back as in that bird. The hens in the yard where these monstrosities were hatched had been frightened by a female parrot which, having escaped, fluttered among them before the eggs were laid, and greatly frightened the hens from whose eggs the malformed chickens were hatched." This would seem *prima facie* to support the theory of maternal impressions, but the fact is that these malformations are simply arrests of development. Birds have many anatomic characteristics in common with the reptiles, whence Huxley has included the two under the general group *Sauropsida*. During the period of development within the egg the fetal chick passes through a reptilian phase, and at the close of this period begins to assume the more strictly avian characteristics. The conditions of toe and beak referred to are passed through at this stage, and if, owing to some cause or other, development is partly arrested, the result may be such as was seen in the abnormal chickens referred to. Kiernan refers to 2 cases shown by him at the Chicago Academy of Medicine, one of which was an infant born with a conformation of head and face resembling somewhat that of a calf. Such cases presented features which might be a "basis for a myth like that of Europa and the bull, or that of the extravagant antics of Pasiphaë, which produced the Minotaur." In one of the cases just referred to, the neighbors attributed the peculiar condition of the infant to a fright by a bull, which occurred at the eighth month of pregnancy. The bull-like face in this case is the result of an arrest of development at a much earlier period than the eighth month, and is probably the result of errors of development occurring probably in the first month of fetal life. In the second instance—namely, the birth of a double-headed monster—the condition was attributed to a fright during the seventh month of pregnancy on seeing a picture of a double-headed monster at a traveling show. It is perfectly clear, adds Kiernan, that "this fright could have had no influence whatever in the production of the monstrosity." The third case was a cyclops. Cyclopia is the result of arrested development of the ordinary pair of eyes, and undue development of the median pineal eye, the latter condition being still persistent in some lizards. Dareste has shown that the production of such a monstrosity is associated with other important teratologic changes, such as atrophy and displacement of the

¹ Jour. Am. Med. Assoc., Dec. 9, 1899.

olfactory apparatus, changes in the structure of the mouth, and arrests of development of the cerebral vesicles, the determining causes of which must be exerted very early in the life-history of the embryo. In this case the mother, who was a girl of 17, visited a circus when in the eighth month of pregnancy. This was followed by a dream about animal monsters, and to this dream was ascribed the monstrosity. It is obvious, of course, that the dream exerted no influence whatever in bringing about the fetal monstrosity, the origin of which must have dated back 7 months at least. [It must be remembered that profound shock, destitution, and want of food act on the mother, and may influence the fetus deleteriously. Hence the significance of the fact that of 92 children born in Paris during the siege of 1870-71, 64 had slight mental or physical anomalies. The remaining 28 were all weakly; 20 were weak-minded, and 8 were subjects of moral imbecility. In Berlin the financial crisis of 1875-80 was followed by an increase in the number of idiots born. Not only do poverty and want produce anemia and malnutrition of the fetus, but profound shock disturbs the whole bodily metabolism, and it is probable that the nutrition of the mother might thereby be so disturbed as to result in a partial toxemia, which would tend to check or disturb the healthy development of the fetus *in utero*. In this way a nexus of cause and effect may be traced, but facts which can be thus explained give no support to the view of mental impressions popularly entertained.]

Experimental Production of Tumors by Implantation of Embryonic Tissues.—Birch-Hirschfeld and S. Garten¹ have in a small proportion of cases succeeded in producing neoplasms in adult animals, such as rabbits, fowls, frogs, and salamanders, by the implantation of finely divided pieces of embryos in the liver. In some instances the tumor-like new-formation consisted only of cartilage, but in others it contained tissue of an adenoid nature, epithelioid cells, and pigment-like cells. The results, however, were not permanent, for in some weeks or months the growths became encapsulated, retrogressive metamorphosis set in in the tissues composing them, and finally absorption took place. The growth, therefore, of the embryonic tissues was only a temporary matter. Some of the negative results were interesting: thus, in the case of 2 rabbits the injection into the liver of pieces of kidney, cartilage, decidua, and eye-pigment from nearly full-time embryos resulted in nothing save the production of some necrosis and atrophy of the hepatic cells and some isolated cicatrices in the liver.

Monstrosities.—Gheorghiu,² at a recent meeting of the Société d'Obstétrique de Paris, gave statistics obtained at the Maternité during 1897, 1898, and 1899, bearing on the question of infection of the parents and malformation of the progeny. He found that there was scarcely an infant showing arrest of development or a malformation which did not possess a mother or a father or both suffering from some infectious condition, such as typhoid fever, tuberculosis, scarlet fever, syphilis, measles,

¹ Beiträge z. path. Anat. u. z. allg. Path., vol. xxvi, p. 132, 1899.

² L'Obstétrique, v, p. 63, Jan., 1900.

etc. The more intense the infection, the more probable was it that the infant would show malformations. Multiple malformations generally pointed to a very marked maternal infection. The infants were generally born slightly prematurely and below weight. There was rarely a history of traumatism or of maternal impression, and in only one instance was there consanguinity. Gheorghiu thinks that there is undoubtedly a relation of cause and effect between the infection and the malformations, but there are other circumstances which intervene. A. Keith¹ gives the anatomy of two specimens of **dropsical parasitic fetuses**. One, given to him for examination by Lewers, was at full time; the other was in the fifth month. In both the circulation was carried on by the host fetus, each fetus being one of twins. Each fetus was therefore of the nature of a bud, the parasite being supplied with impure blood from the host. In both specimens the hinder extremities and the caudal ends of the body were better developed than the anterior extremities and cephalic ends. The principal interest in these specimens lay in the fact that they reproduced the lesions which many observers had experimentally produced in chick embryos hatched under abnormal conditions of temperature and position. These chicks showed (1) dropsical conditions of the tissues and closed cavities, especially a dropsy of the central nervous canal; (2) malformations of the blood-islands and primary blood-vessels; and (3) abnormal segmentation of the trunk. Such lesions appeared in the two specimens, and probably as early as the fifteenth day. In the younger of the two, segmentation forward had been arrested at the seventh cervical segment, the central nervous system in front of that point being absent. The foregut was also absent, but the glands and structures derived from that part of the gut, the heart, nodules of bones representing the mandible, hyoid, and base of the skull, and three processes representing the frontonasal and lateral maxillary processes were present. In the larger specimen anterior segmentation was arrested in the frontal region, the frontonasal and maxillary processes being present, with the cerebral vesicle and central nervous tube, which was so widely dilated that it had burst the skull apart, and carried with it the separated bones on the one side and the shoulder-girdle on the other. The foregut was present, together with the lung-buds and a small, functionless, three-chambered heart. In the smaller fetus segmentation had proceeded backward to the third coccygeal segment, leading to a normal development of the hindgut and its derivatives. In the larger specimen segmentation was arrested at the first lumbar vertebra, with a result that the hind-limb buds were left in close contact, a symelian extremity resulting. Many ribs and vertebræ were imperfectly separated. The hindgut ended blindly, and there were no external genitals. The blood in the umbilical vein showed more leukocytes than red blood-discs. The subcutaneous tissue was mucoid; there were no structural differences between arteries and veins; and nucleated corpuscles, some containing hemoglobin, were found in the bone-marrow. In both specimens the thyroid, spleen, thymus, and liver were absent. In the large fetus,

¹ Brit. Med. Jour., Mar. 17, 1900.

ovaries and rudimentary kidneys were present; and in the smaller fetus the genito-urinary arrangements of a fifth-month fetus were noticeable. These dropsical parasitic fetuses were probably the result of an imperfect division of the ovum to form twins. It was known experimentally that absorption of part of a segmenting ovum led to such errors in development. A parasitic fetus was probably the result of the unequal division of a twin-forming ovum. F. H. Parker¹ reports the case of a **fœtus papyraceus**, and Heynsbergh² a case of **ischiopagus**. [This must not be confused with **pygopagus**, in which the twins are placed back to back, united at the sacrum; nor must it be classified with **ischiopagus parasiticus**, in which one twin is an ill-developed parasite, consisting of arms and legs with no head and little or no trunk, appended to the lower part of the autosite, and in no way connected with the



Fig. 49.—Cyclocephalus (Falk, in Phila. Med. Jour., Oct. 7, 1899).

spinal column of the latter.] J. C. Falk³ reports an interesting case of **cyclocephalus** (Figs. 49 and 50), as does also F. B. Walker.⁴ An examination of a mesial section of Falk's case gave the following findings: The Eustachian tubes were both present and all the cranial nerves were in pairs except the first (olfactory lobes), which were not discernible at

all, and the second (optic), which was single. The cerebrum was very small, almost rudimentary in its proportions. The pharynx was not imperforate, as seems to be the case in the figure; this is due to the section being to one side of the middle line. W. C. F. Smith⁵ reports the case of a **bicephalic fetus**, in which there were found two separate and distinct heads and necks, fusing at the level of the shoulders into one trunk, which was, however, marked by the existence of two spines, lying some little distance apart, and uniting at the sacrum, which was single. There was no other abnormality of the skeleton, and the arms and legs were normal in number and conformation. The thoracic cavity was partly divided into three compartments by the projection forward into it of the two spinal columns, the interval

¹ Med. News, Mar. 10, 1900.

² Brit. Med. Jour., June 16, 1900.

³ Phila. Med. Jour., Oct. 7, 1899.

⁴ Phys. and Surg., Jan., 1900.

⁵ Lancet, Aug. 19, 1899.

between the latter being bridged across by soft tissue. In the central compartment of the three was the single and normally formed heart, and the two lateral were occupied by normal lungs. The arch of the aorta was normally formed, but gave off arterial trunks to both necks. There were two separate and complete esophagi. The most remarkable feature disclosed by examination of the abdominal cavity was an extensive reduplication of the alimentary canal. The two esophagi each led into a separate stomach. The right of these was a culdesac, and was hour-



Fig. 50.—*a*, Blood-clot in scalp (caput succedaneum); *b*, parietal bone; *c*, frontal bone; *d*, dura; *e*, conarium; *f*, midcerebral artery; *g*, cartilage supporting nasal (?) rudiment; *h*, eye; *i*, *i*, teeth; *j*, mandible; *k*, basi-occipital; *l*, basisphenoid; *m*, ant. arch of atlas; *n*, odontoid process of axis; *p*, spinal cord; *q*, occipital bone; *r*, bulb; *s*, occipital bone; *t*, cerebellum; *u*, torcular herophili; *v*, prosencephalon; *w*, diencephalon; *x*, nasopharynx; *y*, buccal cavity (Falk, in Phila. Med. Jour., Oct. 7, 1899).

glass in shape. The left was small but otherwise normal. The intestine leading from the left stomach was normal in itself, but was accompanied throughout the greater part of its extent by an imperfect gut, which fused with it one inch above the ileocecal valve, the latter as well as the large intestine being normal in every respect. This small intestine of the right side lay side by side with the other below the duodenojejunal flexure. Above that level it was represented by a culdesac extending in the direction of the pyloric end of the right stomach and united with it by fibrous tissue. There was a separate spleen on each side of the abdomen, one in connection with each stomach.

THE PATHOLOGY OF PREGNANCY.

The Pernicious Vomiting of Pregnancy.—Evans,¹ in discussing the etiology of the vomiting of pregnancy, recalls the physiologic characteristic of the pregnant uterus, especially its sensitiveness, irritability, and contractility. Contractions occur regularly during pregnancy, and are most marked at the menstrual epochs; hence the greater liability to abortion at these times. They are also readily induced by irritation of the breasts, especially the nipples; probably any powerful cutaneous irritation can act in the same way. Evans believes that the purpose of these painless rhythmic contractions is to facilitate the circulation of the blood through the large venous sinuses, and that the surcharging of the blood in these relatively stagnant pools with effete material probably acts in some way as an irritant and stimulates the uterus to contraction. On these physiologic data, and on the observation of the phenomena presented by two cases of vomiting, he bases the hypothesis that rhythmic uterine contractions are the primary cause of the reflex irritation which results in paroxysmal nausea and vomiting. In support of this hypothesis, Evans points out that the contractions of the nongravid uterus which follow the introduction of the sound not infrequently result in reflexly inducing nausea and vomiting. Intra-uterine applications are often followed by cramp-like pains, associated with nausea and vomiting. In dysmenorrhea, nausea and vomiting sometimes occur, and Giles has found that in the primipara there is a close and constant connection between the sickness of pregnancy and previous dysmenorrhea. Vomiting is frequently noticed in the first stage of labor, and usually occurs at the acme of uterine contraction. Other hollow viscera also may, in contracting, set up reflex nausea and vomiting. The occurrence of "morning sickness" is thus explained by the author. There is probably more or less accumulation of effete material in the maternal blood in the morning, which leads to increased irritability of the nervous centers. The effect of assuming an erect position is to bring about a determination of blood to the pelvis. This engorgement of the pelvic circulation probably leads to more energetic uterine contraction, which reflexly causes nausea and vomiting. When food is taken before rising, it is probable that considerable blood is determined to the stomach; hence less will find its way to the pelvis when the patient gets up, so that the uterine contractions are then likely to be less vigorous. The beneficial effect of sedatives is probably due to their action in soothing the irritable nervous system, and thus controlling the reflex. The author sums up his conclusions as follows: (1) There exists more or less of a rhythm in the paroxysms of nausea and vomiting in pregnancy; (2) there must also exist a rhythmic exciting cause for these paroxysms; (3) there is a rhythm in the uterine contractions during pregnancy; (4) the essential exciting cause of the nausea and vomiting of pregnancy is frequently the physiologic contraction of the muscular fibers of the uterus. E. Dirmoser² and Buford³ emphasize the toxic theory of the production of

¹ Am. Gynec. and Obst. Jour., Jan., 1900. ² Wien. med. Woch., Oct. 7, 1899.

³ Memphis Lancet, July, 1899.

hyperemesis gravidarum. Buford remarks that since the nausea and emesis of pregnancy often occur when the stomach is empty, and especially in the morning, after the contents of the stomach from the previous day have been passed into the bowels, the idea of a reflex from peripheral irritation of the pneumogastric nerve may be entirely eliminated. This forces the conclusion that there must be a central cause for it, which, from the very nature of the conditions, must be a chemical substance, brought by the blood current in direct contact with the vomiting center, which is in the nucleus of the vagus, in the floor of the fourth ventricle. To explain this he says: The normal result of conception is cell-multiplication, the fecundated cell or ovum elaborating its constructive material from that presented to it by the blood. This cell-proliferation takes place in the fetus, in the walls of the womb, and in the mother, depositing fat for future use. Cell-metabolism is abnormally active in both the embryo and the mother, resulting in anabolism. Constructive metabolism is possible only by the cell appropriating to itself suitable material for its growth. Whether the cell by its inherent power appropriates the proximate principles as such, which are presented in the blood, or by its catalytic force splits up the molecules, and then recombines them, there are left in the blood current certain substances, excrementitious in character, both free and combined, which during cell-metabolism have given up some one or more of their elements, especially oxygen, nuclein, and the sulphur and phosphorus compounds. There also is *pari passu* with anabolism, catabolism. During this process nucleinic acid is liberated, which in turn is split up into uric acid and albumin, the albumin probably recombining, and the uric acid is supposed to be eliminated through the maternal emunctories. The residue left in the maternal blood current is chemical units, which combine and recombine according to biochemic laws to form intermediary and end-products, to be excreted or to perform further duties in the economy, and become deleterious only when they accumulate or are produced faster than they are eliminated. Then during all mitosis we find liberated uric acid in proportion to all metabolism. During the first 4 months of pregnancy both fetal and maternal metabolisms are most rapid, and it is usually during this period that nausea and emesis are most distressing. This period of active development of the fetus and deposit of fat by the mother is the time when the heaviest demands are made for material for cell-growth, and consequently there exists an increased desire for food by the mother. Nature makes provision for the normal elimination of these by-products or leukomains *per vias naturales*, and this is why we see the passage of so much urine during this period. If this excessive urination were due to pressure against the bladder by the growing uterus, we should have a smaller quantity passed at night; but the kidneys secrete at night as well as by day, and we find the bladder responding to the irritation of the acid urine at night as well as during the day. When cell-metabolism is active and heavy demands are made for material, overingestion of food results, and we have then what Ewald calls hyperhydrochloria; and this results in transitory nephritis, which

is first shown by hypersecretion and then by hyposecretion of urine. During this temporary overloading of the digestive tract both ptomains and leukomains are formed, which depress the nerve-centers. Fetal metabolism is progressing, as is also the maternal deposit of fat; and toxins are formed in abnormal quantities and accumulate as the result of defective elimination, the temporary or transient nephritis incapacitating the organs for the full discharge of their physiologic functions. This cycle of vicious influences is repeated day after day in various degrees. Emesis and nausea are worse on awaking in the morning, both as a result of the centers responding then more readily to irritations, and also because during the quiescence of the functions of the skin and bowels there has been an accumulation of this toxin. As to the nature of this substance, we dare not hazard an opinion, further than to say that probably it is an alkaloid of undetermined chemical formula, a leukomain of the uric acid group, which acts centrally on the vomiting center as does apomorphin.

Child-bed and Inflamed Appendix.—Fieux¹ reports the delivery at the eighth month of a girl aged 19 subject to constipation. The child lived and was reared. On the twenty-seventh day violent pains in the right iliac region set in, and 9 days later, after all the symptoms of appendicitis had appeared, Fieux operated and resected the inflamed structure. The patient made a good recovery. On the sixth and eighth days there was a spontaneous action of the bowels, very unusual in this patient's experience. This case supports Pinard's opinion that appendicitis may exist as a complication of gestation in all its stages—pregnancy, labor, and child-bed. Fieux notes Lepage's case, which resembled his own, as the symptoms appeared as late as the twenty-eighth day. He further dwells on the most important question in relation to this subject: Is the appendix infected from the genital tract? Vinay claimed to have proved this condition in 2 cases. But in one there was no rise of temperature for 4 days and no distinct evidence of uterine or perimetric mischief. In the other there was also no fever, but there was much show from retained placental relics. The curet was applied on the thirty-fourth day. Not until a fortnight later did symptoms of inflamed appendix appear, and until they appeared there had been no rise of temperature. The patient, it transpired, had long been subject to pseudomembranous colitis. Abraham's two cases also show no evidence of uterine or tubo-ovarian infection. Fieux agrees with Abraham's theory that the increased tendency to constipation during gestation causes an increased tendency to inflammation of the appendix. The mischief rarely, if ever, arises from the genital tract, save perhaps in cases in which it is diseased.

Valvular Cardiac Disease in Pregnancy.—A. H. Wright,² in discussing this subject, propounds and answers a number of questions bearing on various points, as follows: Should a woman with valvular cardiac disease be allowed to marry? Yes, with certain exceptions,

¹ Compt. rend. de la Soc. d'Obstét., etc., de Par., May, 1899.

² Canad. Pract. and Rev., Dec., 1899.

which may be summarized in Hanfield Jones' words: "If there are any serious symptoms of cardiac disturbance present, or attacks of dyspnea, breathlessness, palpitation on exertion, or hemoptysis, marriage should not be sanctioned." Which of the heart lesions is most serious? Mitral stenosis; then follow aortic stenosis, aortic regurgitation, and, of far less import, mitral regurgitation. How does pregnancy affect the system in cases of heart disease? By disturbing compensation and causing overloading of the pulmonary, hepatic, and renal circulation. This occasionally produces abortion or still-birth. On the other hand, some women appear to improve during pregnancy, the heart taking part in the hypertrophy of this period, though they lose ground after labor.

Treatment during pregnancy: Every patient with heart disease requires watching. In addition: (a) Keep the patient at rest without going to extremes, making this absolute if serious symptoms appear. (b) If the circulation becomes overloaded, administer calomel and Epsom salts; afterward strychnin, with digitalis or strophanthus. Dyspnea is most quickly relieved by amyl nitrite; also dry cuppings over the heart may be adopted. (c) Regulate the diet. Milk diet is best in bad cases; in milder cases a light diet is best, avoiding heavy meats, eggs, meat-broths, and sweets. If no albumin is present in the urine, meat and eggs may be given in moderation. (d) Give no diuretics but water. (e) A daily warm bath is required to keep the skin acting. (f) It is sometimes advisable to produce abortion, if there is early or marked evidence of overloading of the system, and if the symptoms increase while under treatment. (g) Consider the history of previous pregnancies. (h) The production of premature labor is to be undertaken with great caution, as it is "likely to do greater harm than good by disturbing the action of the heart and the condition of the lungs" (Angus MacDonald). Is labor affected? It is unaffected, as a rule. Dyspnea, hemoptysis, precordial distress, and palpitation may be present. The prognosis is doubtful. Some statistics place the mortality between 10% and 60%; the author considers this an overstatement.

Treatment during labor: Continue the previous treatment and give chloroform during the latter part of the first and the whole of the second stage of labor. Ether is contraindicated. The anesthetic reduces the bearing-down to a minimum. There may be a free hemorrhage, which, on the whole, will be beneficial. Finally, watch the third stage carefully, which Hart considers the most dangerous time. These cases require the closest attention for several days, and even weeks, after delivery.

Influenza Complicating Uterine Disease and Pregnancy.—Ameiss¹ believes that serious inflammatory complications of the female pelvic organs are often found in cases of influenza infection. Menorrhagia and metrorrhagia are of frequent occurrence, and even salpingitis and pelvic peritonitis are occasionally met. The author observes that women are most liable to uterine and pelvic complications when the attack occurs at the time of menstruation. Influenza also predisposes to abortion when occurring in a pregnant woman, and the accident is

¹ Am. Jour. Obst., April, 1899.

then usually accompanied by excessive loss of blood. Müller reported 157 cases of influenza in women; 21 of these occurred during pregnancy and 17 of them aborted. [This is, however, a larger proportion than that given by other authors.] Ameiss has observed a case of abortion due to influenza, and gives the notes. When influenza attacks a woman about to be confined, the labor frequently proves tedious, with considerable inertia. Exceedingly bloody and offensive lochia may continue for weeks beyond the normal duration, probably owing to subinvolution. Lactation is often diminished and sometimes checked. When influenza attacks a patient shortly after labor, the onset may be strongly suggestive of puerperal sepsis. In cases of chronic uterine disease the super-vention of an intercurrent attack of influenza nearly always leads to acute exacerbation of the local affection, while tumors, both benign and malignant, are liable to increase in size and to undergo degenerative changes.

Albuminuria in Pregnancy.—Vallois¹ reports 2 cases of slight and transitory albuminuria in pregnancy treated by absolute milk diet, and yet followed by fetal death and premature expulsion of the infant, in one instance at the seventh month and in the other at 7½ months. In both cases the puerperium progressed normally, and in both the placenta was markedly diseased (albuminuric placental changes). In one the placenta showed numerous old hemorrhages, and in the other the placental substance was simply riddled with hemorrhages varying greatly in size, in color, and in consistence, one at least being as large as a hen's egg. [It follows, therefore, that even a slight and passing albuminuria in pregnancy may produce characteristic lesions in the placenta, and that these may kill the fetus. Further, these placental morbid changes may exist when the mother exhibits no other serious complications, and when her general health is good. From this it must be concluded that albuminuria in pregnancy ought to be treated by absolute and continuous milk diet, even when it is slight and transitory, for the sake of the fetus as well as for the good of the mother.]

The Weight of the Fetus and of the Placenta in Cases of Maternal Albuminuria.—Wippermann² tabulates 34 cases of nephritis occurring during pregnancy and of albuminuria during pregnancy, and has studied the effects of these conditions upon the fetus and the size of the placenta. Of these cases, 11 had chronic nephritis, and none of them went to the normal termination of pregnancy; 2 of the 11 died in the ninth month; 23 patients had acute nephritis of pregnancy, and of these 3 died shortly after delivery. As regards the placenta, it is interesting to note that in chronic nephritis infarcts are present in the placenta in 90% of cases. In the acute nephritis of pregnancy infarcts are present in 65% and absent in 35%. His investigation shows that chronic nephritis profoundly influences the placenta and brings on labor before the natural end of pregnancy. The development of the entire ovum is greatly affected, and many of these children perish. Albuminuria lessens the

¹ L'Obstétrique, No. 6, p. 585, Nov. 15, 1899.

² Arch. f. Gynäk., 1899, Bd. LVII, Heft 3.

development of the fetus and makes its weight less in proportion to that of the placenta. [It is interesting to compare albuminuria and syphilis, as both conditions result at times in fetal death, and both influence the development of the fetus. In each of these conditions the placenta is relatively larger than normally : in the case of albuminuria because the child is less well developed, while in syphilis the increased weight of the placenta results from the deposit of foreign material in its tissue.]

Glycosuria Gravidarum et Puerperalis.—Leon Leduc¹ gives the report of an extensive series of investigations made on 29 women at various stages of pregnancy and of the puerperium to determine the question of physiologic glycosuria. The methods used were (1) the saccharopolarimeter ; (2) the reduction method with the copper salts (Fehling's and other solutions) ; (3) the fermentation test ; and (4) the test with the phenylhydrazin-osazone method of Fischer. The urine was treated with chloroform or with naphthol and placed in a cold chamber to prevent decomposition. Several hundreds of observations with quantitative estimations were made. Observations show that lactose is present in the urine, and more abundantly than glucose. Leduc accepts (with Brücke, Pavy, and others, *contra* Maly, Seegen, von Jaksch, etc.) a physiologic glycosuria, after taking coffee and certain fruits, which is less marked at night than in the day. Part of the glycosuria in women is from hepatic instability. In pregnancy the urine toward full term has more water and less solids (less phosphates, uric acid, urea, and creatinin) than in the normal state. Glucose is absorbed by the mammary glandular tissue from the blood, and lactose is probably prepared synthetically in the gland-cells. It is lactose which occurs to any notable extent in the urine of late pregnancy and of the puerperium, especially in women with full breasts and abundant milk. The lactose is reabsorbed from the breasts into the general circulation, and thus, like a subcutaneous injection, it finds its way to the kidneys and is eliminated in the urine. The general conclusions are as follows : (1) During pregnancy the reducing power of urine grows less in proportion as the solids of the urine diminish toward full term ; (2) the lactosuria of pregnancy arises from women whose breasts have a large quantity of colostrum during pregnancy. Lactosuria coincides with or follows glycosuria ; both are, however, slight, and both physiologic at this stage ; (3) in 60 % of cases no sugar could be detected in the urine of pregnant women ; (4) an intercurrent albuminuria does not decrease or increase the sugars ; (5) after confinement, however, the reducing power of urine rapidly augments from a lactosuria ; (6) this lactosuria is associated with a fullness of milk in the breasts, and is at its maximum when the breasts are not relieved ; (7) in cases of abortion or premature labor, or of death of the fetus *in utero*, a slight lactosuria appears, but more slowly than after normal labor ; it disappears with the flow of milk from the breasts ; (8) lactosuria results from the absorption of lactose by the veins and lymphatics of the breast into the general circulation, and this is gradually eliminated by the kidneys. If the woman is deprived of her child, the lactose augments,

¹ Thèse de Paris, Dec., 1898.

and it may even be (as experimentally shown in the case of two bitches) then accompanied by glucose. [Traces of sugar are of common enough occurrence in pregnancy, but when large quantities have been found, the labor has usually terminated unfavorably in one way or another. From the analogy of surgical operations to confinements, we should expect the presence of any considerable amount of sugar in the urine greatly to prejudice the prognosis.]

Pyelonephritis of Pregnancy.—According to C. B. Reed,¹ it is largely owing to the efforts of Vinay and others of the French school that pyelonephritis of pregnancy has been isolated as a specific accident of gestation. Kruse, in his inaugural dissertation (Würzburg, 1889), foresaw its existence; but to Reblaud, in a paper read before the Congress of Surgery in 1892, belongs the honor of separating the disease from other urinary disturbances and describing its origin and clinical course. The disease is relatively rare; thus, Olshausen reports 25 cases; Vinay, 9 cases since 1893 from his service in the Maternity at Hotel Dieu; Navas, 11 cases altogether; Reblaud, 3; Bue, Routier, de Lille, and Bonneau, each 1. It is probable that many cases either have escaped observation or have not been reported. The time of the attack is quite suggestive and nearly constant in the middle and later months of pregnancy. It rarely occurs before the fourth month, usually from the fifth to the eighth, and sometimes in the course of the ninth, or even some days before labor. There is a slight predilection for multiparæ, according to Vinay's cases, only 2 of which are primiparæ. These observations do not support the position of Halbertsma and Olshausen, who maintain that ureteral compression is determined by the fetal head, and occurs, therefore, earlier in primiparæ than in multiparæ. It is certainly justifiable to assume with Bonneau that all accessory conditions which add bulk to the pelvis, or the presence of inflammatory exudate, can become predisposing causes by favoring ureteral compression. Infection is favored, in addition, by fatigue, overwork, cold, and especially constipation. Vinay shows that the pathology is determined by two main factors: First, the ureteral compression which results in stagnation of urine, and to a certain extent prepares the way; and, second, the infection which easily occurs when the foregoing conditions are present. That compression of the ureters is common in pregnancy has been demonstrated many times statistically, notably by Halbertsma and Leyden, who correlated it with eclampsia. Cruveilhier has stated that during his service at the Maternity Hospital all women who died during pregnancy or shortly after delivery had dilated ureters. Not only is dilation present to a very variable degree, but necessarily the tonicity of the walls is greatly diminished. The compression is easily explained by reason of the close relations existing between the ureter and uterus on the one hand and the pelvic brim on the other. Thus, according to Ricard's experience, an interval of only 1.5 cm. exists between the ureter and uterus, and from 2 cm. to 5 cm. separates them from the pelvic rim in the nonpregnant state. If affected at all, a very small obstacle suffices

¹ Phila. Med. Jour., Dec. 9, 1899.

to obstruct the flow of urine in the ureters. Halbertsma found (dog) that a weight of 5 gm. placed on a ureter 8 mm. in diameter obstructed a column of 400 gm. of fluid. Ludwig and Löbel have shown that the pressure of urine in the pelvis is always very low, and can not exceed 10 mm. of mercury. Admitting the ureteral compression, which seems amply demonstrated, how shall we explain the very evident predilection for the right kidney in these cases? In the 25 cases reported by Olshausen, of which 12 were unilateral, 10 occurred on the right side. Stadtfeldt's statistics show the same. Vinay claims that this is due to the normal inclination of the uterus to the right, which is intensified in pregnancy and rotates in the axis of greatest development a little to the right. It would be rational to expect that a majority of these cases would be infected from the bladder, the inflammation beginning as a cystitis and traveling up; but, as a matter of fact, the lesion is usually primary in the pelvis of the kidney and ureter, developing through the intervention of the circulation, blood and lymph, and the bladder may be infected secondarily, although it shows extreme tolerance. That this is possible is shown by the experiments of Reblaud and Bonneau, who ligated aseptically the ureters of 4 rabbits, and injected into the vessels of the ears of 2 of them cultures of streptococci, and *Bacillus coli* into the ears of the other two, and in all cases produced pyelonephritis, and in each found a microbe in the pus. Posner and Lewin ligated the urethra and mechanically closed the anus of rabbits, and the bacteria from the intestine appeared in the urinary passages; but this did not occur if the urethra alone was ligated. If the vessels of the kidney were ligated at the same time, that kidney remained free from infection. The infective agent was found by them to be *Bacillus coli* in a majority of cases, and this was confirmed by Reblaud in 3 cases, Vinay in 3 cases, and Weiss in 1 case. Melchior also considers this germ the most common, not only in cystitis, but in pyelitis and pyelonephritis.

Osteomalacia in Pregnancy.—Schuchardt¹ states, with regard to the course pursued by puerperal osteomalacia, that the disease seldom attacks women who live under hygienic requirements. The miserable overworked and underfed peasant, living in damp and unhealthy surroundings, is the principal victim. Even here certain endemic influences obtain, so that Italy and Switzerland take the lead over other countries in morbidity. As a rule, multiparæ are attacked by preference. The pelvic bones are first affected, and, under the influence of the warmth of the bed, rheumatoid pains set in. Tenderness over one or both ischial tuberosities is an early symptom, interfering with sitting. The pains appear wherever softening is in progress. The patient loses rapidly in height, even to the extent of a foot or more. The joints appear to be involved in a sort of arthritis deformans, and fever is occasionally present. Changes in the muscle often occur, not unlike those of progressive muscular atrophy. The peculiarity of gait is thought to be due to paresis of the iliopsoas muscle. Later on, it is found impossible to abduct the thigh, and eventually, of course, all locomotive efforts become impossi-

¹ Obstetrics, June, 1900.

ble. The condition may last for years with exacerbations and remissions. Particular deformities may result from various positions assumed while the patient is bedridden. In diagnosis the affection has not infrequently been confounded with various diseases of the spinal cord. Symptoms of great value in the early diagnosis are the isolated iliopsoas paresis, the diminution in height, and the alteration in the measurement of the conjugate. With regard to treatment and prognosis, Winckel has seen spontaneous recovery. Tonic and hygienic measures of all sorts are prescribed, and prolonged treatment with phosphorus appears to give excellent results. Cod-liver oil is usually given as a synergist. The fact that the pelvic bones have undergone softening and extensibility, despite the pelvic narrowing, does not favor the expulsion of the child. According to Litzmann, there occurred in 72 osteomalacic women only 21 natural labors. In 16 cases the fetal head was perforated; in 40, cesarean section was performed; artificial premature delivery was the management in 2 cases and symphysiotomy in 1; 7 women had rupture of the uterus and 4 died undelivered. Porro employed his utero-ovarian amputation in these cases with much success. In fact, Fochier, of Lyons, and Levy, of Copenhagen, who have done many Porro operations in these cases, came to the conclusion that the castration incidental to this form of intervention has a salutary action upon this disease. Fehling, in 1886, began to test this theory by performing simple castration in these cases, with astonishing success, and the practice has now become general. Even after the first day of the intervention the pains abate and the tenderness becomes less marked. [In a small minority of cases no benefit is received from the operation, which should not be performed until all other measures have failed.]

Chorea Gravidarum.—Mastier¹ has collected 239 cases of chorea gravidarum, and has been able to deduce several interesting facts from his observations. As is well known, chorea gravidarum usually appears in primiparae from 18 to 24 years of age, but Mastier draws attention to a point not sufficiently emphasized: namely, that the chorea frequently appears in a patient who has suffered from the ordinary form on some previous occasion. Moreover, chorea gravidarum differs from true chorea in several points, notwithstanding its general resemblance. It is also shown that the majority of those who as children were affected with chorea do not show the least involuntary movement during the first pregnancy, though they may show symptoms in succeeding ones. Moreover, the neurosis of childhood may assume curious features under the influence of pregnancy. Hysterical manifestations are extremely frequent during pregnancy in women who have suffered from chorea in childhood. Chorea gravidarum may come on gradually or suddenly, and in the latter case is not infrequently due to a sudden fright or emotion. An interesting point is that the onset of the chorea may be accompanied by globus and other symptoms with which we are familiar in hysteria. In some cases the movements are so intense that alimentation is impossible, and the case may rapidly come to a fatal issue unless by some means the movements

¹ Thèse de Lyon, 1899.

PLATE I.



Fibroid tumor complicating pregnancy (Skene, in Am. Gyn. and Obs. Jour., June, 1900).

PLATE 2.



Fibroid tumor complicating pregnancy (Skene, in Am. Gyn. and Obs. Jour., June, 1900).

may be reduced. Many of these cases show extreme constipation—a point of prime importance in treatment. The author discusses the possible bearing of autointoxication in these cases. In the severer forms psychopathic symptoms are marked; there may even be maniacal delirium. Opinions differ as to prognosis, the author being inclined to think that chorea gravidarum is not the grave disorder that some medical writers would have us believe. [This may possibly be due to the employment of intestinal disinfection as practised by him.]

Fibroid Tumor in Pregnancy.—Rosenwasser¹ reports 4 cases of this complication, and presents abstracts of some others recently published. He takes occasion to summarize the rules of practice when the case is seen before delivery, as follows: (a) In the interests of mother and child. (1) Noninterference: Whenever, on account of its location, the tumor will not interfere with delivery, or when its moderate growth will admit of delay until after the viability of the child, a conservative course is clearly indicated. (2) Myomectomy: This operation for pedunculated fibroids is as safe in its results as is ovariectomy under like conditions, but the enucleation of fibroids has been followed by abortion in about 40 % of the cases, and its indications are therefore limited before delivery. (3) Porro's operation: After viability of the child, or at term, if the tumor obstructs delivery and if the uterus must be sacrificed, Porro's operation has hitherto proved the safest procedure. (4) Vaginal cesarean section: A successful case has been reported by Dührssen, who bisected the cervix in its anteroposterior diameter, and who proposes a like delivery in certain cases of myoma low down in the uterus; his advice has not yet been followed [and, we think, with good reason]. (b) In the interest of the mother. (1) Induction of abortion: If the child must be sacrificed, the choice lies between this and hysterectomy. The writer holds that the accidents attending hysterectomy can be more readily controlled than the complications of an abortion, in which the hemorrhage may be fatal, or the fibroids may slough and lead to sepsis. Among cases reported as having aborted, the death-rate has been 12 %. (2) Hysterectomy: This may be required as an emergency operation in cases of intolerable distress from abdominal distention or pressure, or from interference with the vital functions. After delivery the question of operation must be answered, as in the case of ordinary fibroids. J. A. Doléris² summarizes his views on the cases of fibroids complicating pregnancy which should be operated upon, making use of the statistics he has himself obtained and those from other operators. When one has to do with pedunculated fibroids of the cervix uteri, the evident indication is to remove them quickly. When there are very prominent or pedunculated subperitoneal fibroids situated on the fundus or body of the uterus, whether they are small or of medium size, and if they are recognized at the time, then the operation to be chosen is myomectomy, if there be the slightest sign of the pregnancy being interrupted or of danger appearing. Rapid increase in the size of the tumors is a further indication, especially as the maternal mortality (9 %) is really very small and can be

¹ Am. Jour. Obst., Nov., 1899.

² Gynécologie, v, No. 2, p. 114, April 15, 1900.

made smaller. What is to be done with multiple or large intramural fibroids of the uterine body or isthmus in pregnancy is a very difficult question to answer; but, taking all things into account, Doléris is inclined in these cases to make the pregnancy a matter of little import, especially if the patient is a multipara. Early operation has given the least mortality; every week that passes increases the danger, and the risks from early operation are nothing to the later risks to be encountered if the case be let alone. Between 1890 and 1900 there were 31 total abdominal hysterectomies with 1 death (a maternal mortality of 3%). The cases to let alone are those in which there is a single intramural fibroid of moderate size and giving little or no trouble; these are the *noli me tangere* cases. Under such circumstances the obstetrician must await developments. If at or near the full term or during labor serious conditions arise, then, and only then, surgical interference can be considered. A. J. C. Skene¹ reports some interesting cases and presents two instructive illustrations of this grave complication of pregnancy. Plate 1, a front view of the tumor, shows the relations of the uterus to the myofibromas, the uterus being laid open to show the fetus and placenta. Plate 2 represents a section of the tumor including one-half of the uterus, with portions of the placenta in position. The inability of the uterus to contract sufficiently will show the great danger of postpartum hemorrhage.

PLACENTA PRÆVIA.

F. Anderson² emphasizes the danger of this variety of complex labor to the mother, and especially to the child, the maternal mortality being 5% and the infantile mortality 90%; the maternal mortality, however, is one-third less in cases of partial placenta prævia than in cases of central placenta prævia (Glasgow Maternity Hospital). The appalling infantile mortality is largely due to prematurity, but when it is not so, there is hope that it may be reduced by better treatment. He describes the peculiarities of the lower uterine segment, which indicate that it is useful as a passage only, not possessing contractile power, and therefore fitly called the "dangerous placental seat." Hemorrhage is generally the first sign of placenta prævia, and suspicion is aroused by its apparently causeless occurrence, often when the patient is lying down and sometimes when she is asleep. The history of a case of placenta prævia may differ in no respect from any other case until the middle of the ninth month of pregnancy, when a hemorrhage occurs which is really unavoidable and is generally large and sometimes fatal. If this late appearance of hemorrhage were the invariable rule, there would not be so much divergence in regard to treatment. More frequently there are warning hemorrhages in the course of pregnancy from accidental separation of the placenta, and many miscarriages are probably due to this cause. Vaginal examination shows boggy of the lower uterine segment and absence of ballottement; if the placenta is felt, that is

¹ Am. Gyn. and Obst. Jour., June, 1900.

² Lancet, June 9, 1900.

pathognomonic. Abdominal palpation is most useful to those who practise palpation in all cases. The method as described by Pinard and others is best, and with practice there is no difficulty in diagnosing the presence of the soft placenta below the head in the pelvic excavation. In the treatment it has been the practice to temporize until the child is viable,—that is, until the seventh month,—and perhaps when the patient can be kept under constant skilled supervision in a hospital, this is permissible if the hemorrhages are neither too frequent nor too great; but considering the small chance to the child and the great risk to the mother from waiting, it is better in a case of early pregnancy with diagnostic signs of placenta prævia to empty the uterus as quickly as possible compatible with safety. This is certainly the best course for the patient as well as for the practitioner. In general practice the ordeal of waiting is very trying, and no one who has gone through it once would care to do so again. The details of treatment as generally applied are as follows: Bipolar version, preceded in cases of contracted cervix by puncture of the membranes and the use of the cervical plug; but, contrasted with the traditional methods, he eulogizes the Champetier de Ribes bag as an invention which can be used at almost any stage of delivery in placenta prævia. It is an inverted cone when introduced, the apex being at the os internum, and it forms a gentle and uniform dilator of the os uteri; it imitates the bag of the membranes, and the base of the larger Champetier de Ribes bag is of such a size that when it has passed through the os, delivery can be completed. By contraction on the pipe the uterine sinuses can be compressed, and, if necessary, the traction may be maintained for many hours by a light weight. The introduction into the amniotic sac, after puncturing the membranes, by the special forceps is always easy, even when the os is dilated only to the size of little more than one finger, and the bag should be previously scrubbed with soap and water and a nailbrush, and should be dipped into carbolic solution (1:20). This is the rival treatment to sponge tents [which should never be used], and even to turning. Anderson refers to 2 cases in which he has used the bag. In one the placenta was marginal, and when he was called in the night, he found the patient flooding freely and the os uteri admitting little more than one finger. He introduced the bag immediately after rupturing the membrane, distending it with water by means of a syringe, and by using ergot and a bandage and by traction on the pipe he controlled the hemorrhage for several hours, when the bag was expelled; and as the child lay transversely, he turned and delivered. Referring to the objections raised to the use of the bag, he remarks that in order to avoid sepsis it is well to begin by removing the clots at the cervix by a douche. As the bag is introduced into the amniotic sac it takes the place of the water which escapes, and there is no recorded case of rupture of the uterus. It is well, however, to ascertain previously the capacity of the bag and to fill the latter slowly, stopping during uterine contractions. There may be some risk of uterine rupture in the induction of premature labor, as the membranes are not previously ruptured; but here a small-sized bag may be used in the first

instance. There is no doubt that displacement of the presenting head may be caused by the bag, but this can be rectified on withdrawal, if not before. Already statistics show an improvement as regards infantile mortality,—which in Blacker's collected cases was 54%,—with no increased risk to the mother, and Anderson concludes by expressing his belief that this encouraging result will be maintained and improved as the value of the Champetier de Ribes bag becomes more widely recognized.

ABORTION.

The Treatment of Abortion.—Lantos¹ contributes an interesting paper under this title. He limits his cases to those of the first three months of pregnancy, and naturally divides them into threatened and complete abortion. His cases numbered 300, and in them he recognized as the principal complications bleeding and septic infection. His treatment consisted in thoroughly emptying the cavity of the uterus unless he had positive evidence that all of the ovum had been discharged. Thus, in 246 cases the uterus was emptied with the fingers; in 4, with placental forceps; and in 50, with the curet. On examining these patients, in 184 the finger could be introduced into the uterus; in 24, only the finger-tip; and in 10, two fingers; while in 32 it was impossible to introduce the finger. Of these cases, 19 were complete spontaneous abortions and 281 were incomplete. In the 19 cases of complete abortion, 17 made good recoveries without interference. The pregnancy in these cases did not exceed the second month. In 15 the uterus was easily emptied with the finger, while in 4 chill and fever called for the complete cleansing of the uterus, and in 3 of these cases the temperature immediately and permanently fell. One of these cases ended fatally from septic infection; this was the only fatal case in 300. Of the 281 incomplete abortions, in 221 the entire placenta or part of it was retained; in 60, portions of decidua were left behind. The finger was successful in removing the placenta 216 times; in 4 patients the placental forceps was employed and in 1 case the curet; retained decidua was removed 49 times with the curet and 11 times with the finger. The chief indication for active interference in incomplete abortion was bleeding, and of 196 cases of this complication, 195 were promptly controlled by emptying the uterus with the finger. In one of these patients it was considered necessary to inject a preparation of iron to stop the bleeding [a dangerous and, we think, unwarrantable proceeding, when safer methods are at hand]. In two of these fever occurred. One of these patients had an exudate in the pelvis at the time of abortion; the other had scarlatina, followed by a pelvic exudate, but both recovered. In the cases in which the abortion was completed because of the fever the cervix was usually found partly open. Most of these cases did well as soon as the uterus was thoroughly emptied and carefully disinfected. The cases of cureting, 50 in number, had bleeding as an indication in 44 and fever in 6. In all these the curetting was promptly effective. For washing

¹ Monatsch. f. Geburtsh. u. Gynäk., 1899, Bd. ix, Heft 5.

out the uterus lysol was used in patients who had no fever; and in those who had, a weak solution of mercury bichlorid was employed. None of these cases was anesthetized. The writer succeeded by manipulation in pressing down the uterus so that the finger could be introduced. The after-treatment consisted in liquid diet, cold applications to the abdomen, moving the bowels freely, cleansing the external parts with an antiseptic, and limiting vaginal douches to those patients who had fever. The writer sums up his experience in a series of formal conclusions, of which the following are the most important: When the os is but little if at all dilated, bleeding is not an important complication, and may be treated by rest in bed and by vaginal douches. When considerable bleeding occurs, it is impossible to stop the abortion, and treatment should be selected accordingly. Bleeding which persists after an abortion points to the retention of some portion of the ovum in the uterine cavity. As regards the importance of vaginal tampons in these cases, they do not prevent abortion, but their use favors it. When the uterus is empty, as a rule the cervix closes. When, however, the cervical canal is partly open and bleeding is present, it is good evidence that the womb has not been emptied. In cases of complete abortion, when neither the ovum nor the appendages are retained, interference should not be practised except for some serious complication. In incomplete abortion, however, interference is imperative. The use of the intra-uterine tampon of gauze is most successful in cases of hemorrhage in which the cervix dilates but little. As a rule, however, the more rarely an instrument or a finger is introduced within the uterine cavity, the better for the patient. The finger is preferable in recent cases of abortion whenever it can be introduced. When, however, the case has persisted for some time and the cervix is closed, gauze should be employed as a tampon until dilation occurs, when the placenta is expelled, after which the uterus should be curetted. It is seldom necessary to dilate the uterus for curetting in cases of abortion. It is always better to curet or to empty the uterus with the finger than to employ intra-uterine douches. After the womb has been so emptied bleeding should not be present, and its persistence points to the retention of some portion of the ovum. As a general rule, the active treatment of abortion is prophylactic, because it prevents hemorrhage and infection. If the expectant treatment is followed, the patient is exposed to bleeding, anemia, fever, retention of decidua and placental tissues, and chronic endometritis. The danger of active treatment arises only when the operator is not aseptic in his methods. In all cases of septic infection complicating abortion, when either the whole or a part of the ovum is retained, the uterus should be emptied as soon as possible and cleansed with bichlorid solution. When septic infection persists after abortion, the total removal of the uterus, tubes, and ovaries is indicated.

Operations During Pregnancy.—C. P. Noble¹ reports the results of his experience, which embraces 12 cases: 1 of myomectomy, 1 of hysteromyomectomy, 1 of appendicitis with abscess, 1 of intestinal

¹ Am. Gynec. and Obst. Jour., April, 1899.

obstruction after labor, and 1 of fistula in ano. The patient upon whom myomectomy was performed aborted, the operation having been undertaken for supposed ovarian tumors. He considered the operation not justifiable under ordinary circumstances during pregnancy. One other patient aborted, but the ovum was already dead before the operation, which only hastened the inevitable. All the ovariectomies did well; in none of them was there the least difficulty in performing the operation, and in every way the patients made as good recovery as though they had not been pregnant. His experience corresponds with that of other surgeons, and is in happy contrast to the results of the let-alone practice, which so often leads to difficulties in delivery, and, unless prompt and intelligent operative measures are taken, to the bruising, infection, and necrosis of the tumors, with peritonitis subsequent to labor. In the cases of intestinal obstruction, which proved fatal, the operation was complicated by the 7 months' pregnant uterus, which greatly increased the difficulty of finding the trouble in the abdomen and of dealing with the adherent bowel after it was found. This leads him to believe that it would be wiser in such a case, when dealing with so serious a condition as obstruction, promptly to perform hysterectomy and get the big uterus out of the way, and then proceed in a systematic way to do whatever is necessary. He believes that all ovarian tumors which are recognized during pregnancy should be promptly removed, even if quite late, as the risks of operation are much less than the risks of delay. Fibroid tumors should not be operated on during pregnancy, unless for some special reason. With reference to general operations in various parts of the body, while there is little danger of bringing on an abortion, yet he believes the indications for operation should be marked: that is, evidence should be present that the patient's life or health would be jeopardized by allowing the condition to continue until after labor.

EXTRA-UTERINE PREGNANCY.

[As is usual, a number of ectopic pregnancies of considerable interest have been recorded during the year. Among these may be mentioned the following:]

Hue¹ puts on record 2 cases of old extra-uterine pregnancy, in each of which the fetus had passed into the bladder. [It has been proposed by different authorities to treat cases of this kind by one or other of three methods—laparotomy, vaginal cystotomy, or urethral section. The two cases here reported were treated successfully by suprapubic cystotomy. The abdominal cavity was avoided—a point of much importance in cases of this kind, in which it is found necessary to open and cleanse an infected cloaca.]

Cases of recurrent extra-uterine pregnancy are reported by P. A. Harris,² E. R. Smith,³ C. K. Fleming,⁴ and Thomson.⁵ C. F.

¹ Bull. et Mém. de la Soc. de Chir., No. 26, 1899.

² Med. News, April 14, 1900.

³ Southern California Practitioner, April, 1900.

⁴ Phila. Med. Jour., Aug. 19, 1899.

⁵ Monatsch. f. Geburtsh. u. Gynäk., Bd. ix, Heft 4, 1899.

Smith¹ reports an interesting fatal case of interstitial pregnancy, in which the whole fundus of the uterus showed degeneration and thickening of the wall; the laceration was found to the right of the median line and on the posterior aspect; neither tube nor ligament showed any indication of inflammation. M. Herzog² remarks that rupture in tubal pregnancy occurring during the first month is comparatively rare. He reports a case occurring in a diverticulum of the main tubal canal and rupturing in the second or third week.

Ovarian Pregnancy.—[Of late years the possibility of true ovarian pregnancy has been denied by the majority of observers of repute, particularly in England, and it has practically come to be the accepted opinion that all varieties of ectopic gestation are primarily tubal. In the older text-books on obstetric and gynecology ovarian pregnancy was always included in the list of varieties of extra-uterine fetation, and the change of opinion is due chiefly to the influence of the late Lawson Tait, who, in his very able and lucid pamphlet on the subject, published in 1888, enunciated the principle that all forms of ectopic pregnancy have their starting-point in the Fallopian tube. The researches of Clarence Webster, Bland-Sutton, and J. W. Taylor have tended strongly to confirm this opinion. Webster holds that the ovum can be grafted only upon such tissues as can respond to the genetic influence,—that is to say, undergo decidual changes,—and he considers that there is no reason to believe that the Graafian follicles can undergo this “genetic reaction,” and no proof that a pregnancy has ever started in them. Bland-Sutton sums up his views on the subject as follows: “Until some specimen is forthcoming in which an early embryo in its membranes can be demonstrated in a sac inside the ovary, we need not trouble ourselves to discuss ovarian pregnancy.”] A paper by Van Tussenbroek,³ read before the Third International Congress of Obstetrics and Gynecology, would seem to reopen the question. Her paper embodies the results of a very careful examination of the specimen removed and clinically described by Kouwer in 1893, and the conclusion arrived at, on apparently very strong evidence, is that the case was a genuine example of pregnancy within a Graafian follicle. The ovary, which was practically healthy, was separated from the tube by a considerable mesovarium, and the two organs were unconnected by adhesions. A recent corpus luteum was seen in the ovary, and Graafian follicles in various stages of development, but none of them approaching maturity. The tube was normal save for slight twisting and agglutination of its fimbriæ, and its orifice was patent. The ovisac, which formed on the surface of the ovary a tumor about the size of a nut and with a broad base, appeared to be a gravid Graafian follicle. At the base of the sac a sort of diverticulum extended into the substance of the ovary, and the wall of this portion had the structure of an ordinary corpus luteum. The rest of the walls of the sac consisted of the same structure, thinned out by the pressure of the growing ovum. Decidual membrane or cells, such as are found

¹ Med. Rec., Sept. 9, 1899.

² N. Y. Med. Jour., Oct. 21, 1899.

³ Jour. Am. Med. Assoc., Sept. 23, 1899.

in both tubal and uterine pregnancy, were not present. A fetus 12 mm. in length, surrounded by amnion and chorion, lay within the ovisac. Numerous chorionic villi, some in contact with maternal tissue, could be demonstrated between the chorion and the maternal wall of the sac. The conclusions reached are: (1) That ovarian pregnancy is a fact which can no longer be disputed; (2) that ovarian pregnancy signifies pregnancy in a Graafian follicle; (3) that as in this specimen the follicular wall does not show any transformation into decidual tissue, the conclusion must be drawn that Webster's decidual reaction is not a *sine qua non* for the implantation of the ovum; (4) that the regular development in this specimen of normal syncytium constitutes a new and incontestable proof that the syncytium has no connection with the uterine epithelium, but is a derivative of the fetal epiblast. [The importance of this case is enhanced by the fact that it shows the conditions existing at an early stage. Previously described specimens have generally been too advanced to allow of any deductions as to their primary origin or the true relationship of the parts. It would, indeed, appear doubtful whether a true follicular gestation would reach an advanced stage of development if there were no decidual change in the maternal tissues, as this case would indicate.]

Etiology of Tubal Pregnancy.—[The enormous literature of extra-uterine pregnancy contains widely divergent views of etiology, and it appears to be a meritorious act to attempt to survey the accumulated evidence in favor of this or that theory with regard to the cause of this anomaly. Naturally, our study should first be directed to cases of repeated tubal pregnancy, and in individuals thus affected we must assume a predisposition, which may possibly be amenable to treatment.] Glitsch¹ describes minutely two cases in which tubal pregnancy occurred repeatedly. Before drawing conclusions he briefly outlines some of the views of past and present authorities. Virchow thought that perimetric adhesions were the cause of tubal gestation; Martin accused not only these lesions, but also parametritis, neoplasms, or anything which might, by acting mechanically, divert the ovum from its natural goal. Wyder believes that by far the most common etiologic factor is perimetric adhesions, which are able to cause a kinking or stenosis of the tubes under certain circumstances. This author analyzes 6 cases of tubal gestation in which he traced the anomaly respectively to perimetritis, salpingitis, and other kinds of inflammatory mischief. Fritsch regards pelviperitonitis as the chief cause. Von Schrenck (1893) analyzed 610 cases of ectopic pregnancy and discovered etiologic data in 93, as follows: Adhesions and peritoneal bands in 70%; external migration of ovum, 12%; and the rest such isolated causes as diverticulum in the tube-wall, fibromyoma of the tube, etc. Schauta, in 1896, advanced the theory, based on personal studies, that in the majority of instances a predisposition is afforded by catarrhal, and especially gonorrheal, processes in the tubal mucosa. In 46 cases he found (aside from perimetric adhesions) pronounced evidences of chronic salpingitis in 32, while in 9 cases there

¹ Arch. f. Gynäk., vol. LX, p. 385, 1900.

were evidences of gonorrheal infection. Dührssen has found etiologic factors in 35 cases studied by him, as follows: While 4 patients presented no anomalies whatever, aside from the ectopic pregnancy, 24 had affections of the tubes before pregnancy, 3 had uterine disease, 1 had tubal atrophy, 1 an accessory ostium of the nonimpregnated tube, etc. In 10 of the 35 cases there were diseases or anomalies of the nonimpregnated tube. Küstner sums up the causes of ectopic pregnancy in one word—inflammation. Franz, who has recently analyzed the entire material at the Halle Clinic, concludes that inflammations of the tube in the healing stage are chiefly responsible. Freund and Able have been able in a few cases to connect ectopic gestation with arrested development of the tubes (infantile tube). Patellani, in 1893, took a deeper view of the etiology than any of his contemporaries, for he made the anomaly to be a matter of dysteleology, an anomaly of development due to remote inheritance, to reversion to an early and simple condition. Gonorrheal salpingitis, parametritis, and perimetritis have each been accused of playing a causal rôle here. Prochownick, however, showed by experiment that a gonorrheal salpingitis does not necessarily contribute to the production of tubal pregnancy. Ahlfeld, out of 12 cases of the latter anomaly, found but one which could be attributed to gonorrhea. Glitsch analyzes at great length, and finds that, at least in these two instances, both endosalpingeal processes were combined with perimetric alterations. The author also analyzes 45 cases of tubal pregnancy in general, and concludes as follows as to the general etiologic factors of this anomaly: (1) There is no single cause. Usually there is predisposition, inherited or acquired, which furnishes the occasion for the lodgment of the ovum. (2) By far the most common causes are inflammatory affections within the tubes or in their environments. (3) These inflammatory alterations are almost necessarily due to the action of micro-organisms—tuberculous, puerperal, gonorrheal. (4) Of these various micro-organisms, by far the most prevalent as a cause of tubal pregnancy is the gonococcus of Neisser. (5) Therefore we must ascribe the causes of the majority of cases of this type of ectopic gestation to a latent or residual gonorrhea.

Pain as a Symptom of Ectopic Pregnancy.—H. C. Coe¹ discusses pain as a symptom of ectopic pregnancy. Apparently nothing should be easier than the diagnosis of this condition, but every operating surgeon has frequently met it when it was entirely unsuspected, or has opened the abdomen in a case which presented almost typical symptoms and found only diseased adnexa. The writer gives a number of cases illustrating the difficulty of diagnosis and the significance of pain as related to this condition. The pain will vary according to the location of the ovum, and whether the tube is free from adhesions. If implanted near the fimbriated extremity, it may be expelled into the peritoneal cavity at an early stage. In these cases pain may be comparatively slight, and they form a class which is often taken for a diseased appendix. Pain alone, when not accompanied by a clear history of menstrual irregu-

¹ Med. News, April 21, 1900.

larity, symptoms of pregnancy, and the appearance of a tumor at the side of the uterus or in Douglas' pouch, is to be regarded as an indication of extra-uterine pregnancy only under certain conditions. Such are found when the pains are of a sharp, colicky character, distinctly located on one side, attended by faintness, and followed by remission. The pulse is accelerated during the attack, but there is no rise of temperature; the latter commonly distinguishes ectopic pregnancy from inflammatory conditions. The violent tearing pain attending intraperitoneal rupture is accompanied by the appearance of an internal hemorrhage. In extraperitoneal rupture the symptoms vary according to the amount of blood lost, but soon subside, being succeeded by the usual evidences of pressure, resulting from a mass in the folds of the broad ligament, which displaces the pelvic organs. A persistent pain following an acute attack may indicate localized peritonitis.

Anatomy of the Reflexa in Tubal Pregnancy.—A. Couvelaire¹ has made a study of the mucous membrane of the Fallopian tube in tubal gestation, and formulates the following conclusions: (1) There exists in the gravid tube during the first month a membrane which limits the free pole of the ovum and acts as a reflexa. (2) At the level of this reflexa chorionic villi and the intervillous space, 66 days after the last menses, are as much developed as at the level of the parietal insertion of the ovum. A little later—about $2\frac{1}{2}$ months—atrophy of this reflexa, by means of thrombosis of the umbilical vessels and atrophic degeneration of the villi of the chorion, is already accomplished throughout nearly the entire reflexa. (3) The membrane which separates the intervillous space of the tubal cavity at the free pole of the ovum is constituted by two distinct layers: (a) an internal continuous layer, compact—the cellular layer of the reflexa. It is constituted by large, living cells, grouped into a solid mass, lodged in alveoli of an amorphous intercellular stroma analogous to the fibrin streak of the uterine ovum. This collection of large cells is in relation of continuity with the cellular tufts of fixation (epithelial processes), the crumpled villi of the reflected placenta. A certain number of these cells are undergoing degeneration, which begins in the more excentric layers. It accompanies the atrophy of the reflected placenta. At about $2\frac{1}{2}$ months, in his specimen, it was almost total. (b) An internal, noncontinuous, fibrinous layer, strewn with degenerated cellular elements and infiltrated with round cells, more numerous in the specimen of $2\frac{1}{2}$ months than in the younger preparation. (4) At the source of reflection the internal layer of cells of the reflexa is continued in its entirety, unmodified in the zone of parietal fixation of the ovum, to form a complete capsule for the latter. The fibrinous layer has ceased. (5) The cuboidal epithelium which covers the sector of the free tube opposite the reflexa is arrested at the summit of the angle of reflection, or is reflected for a very short extent ($\frac{1}{2}$ mm.) of the cellular layer of the reflexa. There are found, at a distance from the sinus of reflection, some tracts which cover the external surface of the internal layer of the reflexa at the points at which the fibrinous

¹ *Obstetrics*, June, 1900.

layer is nonadherent to the said internal layer. (6) Sixty-six days after the last menses, in this specimen, the reflexa presented neither vessels nor basal buttress of vessels, and the living decidual cells became continuous with a parietal decidual layer, as in the uterus. (7) The decidual action in the gravid tube during the first months is far from being as intense or as general—even in the zone which is in relation with the immediate vicinity of the ovum—as it is in the gravid uterus of the same age. The **treatment of full-term ectopic gestation** has commanded the attention of Dunning¹ and E. B. Cragin.² Dunning opens the question whether, when the child is alive, operation should be undertaken at or near term with a view to saving the child; or whether it should be postponed until after the latter's death. He quotes the generally accepted rule that by waiting the operation is safer for the mother; but, in view of the statistics which he has collected, he is disposed to question this rule. As regards operations during the viability of the fetus, he has found 25 recorded cases—namely, 13 in Harris' tables, 7 in those of Ayers, and 5 collected by himself; of the 25 mothers, 15 recovered and 10 died, the percentage of recoveries being 60. Of cases operated on after the death of the fetus, Ayers collected 16 and the writer 15 during the years 1894-96; this gives 33 cases, in which 19 mothers recovered and 14 died, the percentage of recoveries being 57.7. He recognizes the fact that the ectopic fetus is often a deformed and otherwise unsatisfactory individual, whose lease of life is usually short; and so, if the maternal mortality were increased by trying to save the child, he would not advocate the plan. But in view of the results obtained from his statistics, he holds that in the majority of cases the operation should be undertaken while the child is still living, as he considers that it can now be safely affirmed that this is the safer course. Notwithstanding the patent fetal defects, Cragin concludes that the viable ectopic fetus is worth saving, and that within well-defined limitations attempts to save the child do not seriously increase the mortality or morbidity of the mother.

LABOR AND THE PUERPERIUM.

The Position of the Gravid Uterus.—MacLennan³ writes on the position of the gravid uterus at the onset of labor, as regards rotation and lateral deflection. In his observations the position of the uterus was determined by palpation of the round ligaments, which are easily recognized during labor pains. The uterus is said to be symmetric in position when its long axis is in the middle line of the body, and when the origins of the right and left round ligaments are equidistant from the middle line, showing that the uterus is not twisted on its long axis. Right or left flexion is present if the long axis of the uterus inclines to the right or to the left. Right rotation occurs when the uterus is twisted on its long axis toward the right, the left round ligament coming forward, the right passing backward. In left rotation the reverse occurs.

¹ Am. Jour. Obst., Nov., 1899.

² Ann. of Gyn. and Ped., May, 1900.

³ Glasgow Med. Jour., July, 1899.

The results of the author's observations are expressed in the accompanying diagrams. (See Figs. 51-56.) He gives the presentation and position of the fetus and other relevant details in each of 36 cases, and draws the following conclusions : (1) Right flexion with right rota-

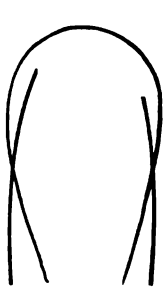


Fig. 51.—Symmetric uterus (11 cases—7 primiparæ, 4 multiparæ).



Fig. 52.—Rotation alone: *a*, Right (5 cases—3 primiparæ, 2 multiparæ); *b*, left, (5 cases—1 primipara, 4 multiparæ).



Fig. 53.—Rotation to right, flexion to left (1 primipara).



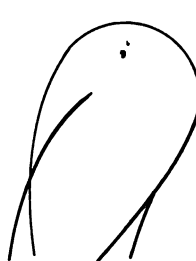
Fig. 54.—Flexion alone: *a*, Right (no case); *b*, left (2 primiparæ).



Fig. 55.—Rotation to left, flexion to right (no case).



Fig. 56.—Rotation and flexion: *a*, Right (11 cases—8 primiparæ, 3 multiparæ); *b*, left (no case).



Figs. 51-56.—The position of the gravid uterus at the onset of labor (MacLennan, in Glasgow Med. Jour., July, 1899).

tion is by far the commonest deviation. No case of the converse was observed. (2) Flexion is caused by purely mechanical conditions, and it will tend to produce rotation to the same side. (3) Flexion has no relationship with presentation or position of the fetus. (4) Rotation is due to laxness of the uterine ligaments, and possibly to irregular con-

traction, but not to an irregular arrangement of the muscular fibers. It may replace lateroflexion as an attempt at accommodation. (5) Flexion without rotation was observed only in contracted pelves. (6) An absolutely symmetrically placed uterus is more common in primiparæ, but one medianly placed and accompanied by rotation is commoner in multiparæ.

Antisepsis in Labor.—Bond¹ recommends the rubber finger-cot for vaginal examinations, especially in obstetric cases. It protects the finger from poison, it glides easily into the vagina, and it does not bring away the lubricating mucus to the extent that the bare finger does. The vulva should be washed, the labia separated, and covered with a fold of fresh gauze or a piece of fresh muslin containing a vertical slit. The finger may then be introduced without coming in contact with any unsterilized surface. By these simple measures asepsis is secured and the physician is saved the time and trouble of attempts at disinfecting the hand by means which often appear to the patient to be needlessly complicated. The finger-cot may be laid aside in a disinfecting solution until the next examination, but each time a fresh piece of gauze should be used. All necessary information can be gained through this thin rubber. For rectal examinations or for the digital examination of any unwholesome cavity, the rubber cot should appeal to every surgeon who cares for cleanly hands. [This method appeals to us from an antiseptic point of view, but we feel that, at least to a certain extent, it disturbs the diagnostic powers of the accoucheur. This is also true of the use of rubber gloves for abdominal surgery.]

Anesthetics in Labor.—An editorial² remarks as follows: The common use of alcohol to assist in parturition has caused the erroneous assumption that women in childbirth enjoy an immunity from the toxic effects of the drug. Simpson's early dicta upon the safety of chloroform, although unhappily not confirmed by experience, have survived among many when applied to obstetric cases. Kidd, who wrote some of the first papers upon the subject, collected reports of various deaths under chloroform which have occurred in women during childbirth, and, as we have more than once insisted, stated that chloroform has no selective action on persons, and is just as liable to kill during an obstetric as during any other operation. That deaths are comparatively infrequent is due to causes other than an assumed capricious departure from a physiologic law. Women in childbirth are seldom brought completely under the influence of chloroform; they are not allowed to pass beyond the second degree of narcosis, in which no paralysis of the respiratory centers can occur. The patient has no fear of the chloroform, but readily takes it, and does her best to breathe freely in order to be rid of her pain. Her mind is set on anything rather than her possible extinction by the anesthetic; so she does not hold her breath nor struggle, as by so doing she would increase her labor pains and cause herself suffering. However, deaths do occur sometimes through feebleness of the heart and circulation; seldom, if ever, from vasomotor paralysis;

¹ Maryland Med. Jour., Oct. 14, 1899.

² Brit. Med. Jour., Jan. 6, 1900.

and not often from respiratory paralysis, since, as we have pointed out, deep anesthesia is not desirable and is seldom obtained.

Indications for Chloroform During Labor.—Bacon¹ calls attention to the increase in the total volume of blood in the pregnant woman, and writes that the increase is observed in the watery elements, in the white corpuscles, and in the amount of fibrin, there being a corresponding deficiency in albumin and in the proportion of the red blood-corpuscles. This increase in volume explains the cardiac hypertrophy, the latter lessening the liability of death from chloroform inhalation. Chloroform lessens the oxygen-carrying power of the blood, diminishes muscular irritability, and weakens muscular action. It is contraindicated in emphysema, in syncope, and when there is dilation of the heart. In the first stage it should not be used, as uterine inertia may result, necessitating the application of the forceps. The amount administered as labor reaches its climax should be carefully considered, as the tolerance is very great at this time. There may follow, as a result of a too indiscreet administration, hemorrhage, depression of circulation, venous engorgement, and cerebral anemia. It is well to give ergot after chloroform anesthesia. Chloroform acts well in valvular lesions of the heart, especially when the heart-action is labored and irregular; when there is disease of the blood-vessels, thus lessening danger of rupture; in albuminuria, with and without eclampsia, its action being to diminish the amount of albumin; in certain cases of delayed labor it hastens delivery; in abnormally intense pains in hysteric women; during the second stage of labor; during the application of forceps; and during version.

Position in Labor.—W. E. Fothergil² has made a careful study of the best position for a woman to occupy in labor. He claims that the squatting position is the attitude in which unaided parturition proceeds to the greatest advantage, but this position is fatiguing to the patient and very inconvenient for an attendant. The left lateral or obstetric position is practically the same, and is convenient and comfortable. Hence he concludes that for labor presenting no difficulty the left lateral posture is best. If the head is arrested at the brim, Walcher's posture is advised. For the head arrested at the outlet of the bony pelvis, the lithotomy position is recommended (the thighs pressed against the abdomen). If the head is arrested on the perineum, the legs should be extended at the hips. Dickinson³ reviews at some length the literature and the experimental investigation of the effect of the Walcher, the Trendelenburg, and the Mercurio postures in altering the size and shape of the pelvis. The literature of the subject is considerable and the opinions of the different authors are greatly at variance, but his studies lead him to make the following deductions: (1) Posture will notably alter the shape of the pelvis in late pregnancy. (2) Increase in available room in the pelvic cavity as a whole can not be brought about. (3) To obtain the longest conjugate at the inlet, the hanging dorsal posture is to be employed. The gain is nearly 1 cm. (4) To obtain the longest

¹ Northwestern Lancet, Mar. 15, 1899.

² Med. Brief, Jan., 1900.

³ Am. Jour. Obst., June, 1899.

conjugate at the outlet, the full-flexed dorsal posture is necessary. The increase promises to be from 1.5 cm. to 2 cm.

The Preservation of the Perineum.—J. M. Barbour¹ draws attention to a simple instrument (Fig. 57) which will be found useful in preventing perineal laceration during childbirth. In conception and application it is suggestive of the "shoe-horn," and similarly lends itself to a double movement: (1) A forward scooping one, in which the fetal head is brought forward under the pubic arch; and (2) a backward one, in which stretching of the perineum may be accomplished without the repeated introduction of the fingers, and where the instrument may be left *in situ* during the interval between the pains. It is in its first application, however, that it will be found especially useful, for this forward movement of the fetal head can be only imperfectly assisted by digital manipulation of the greasy vertex, and is less offensive than the suggested introduction of the fingers into the patient's rectum for the purpose.



Fig. 57.—An instrument for preventing perineal laceration in childbirth (Barbour, in Brit. Med. Jour., May 5, 1900).

The Third Stage of Labor.—George Cole-Baker² concludes a paper on this subject by directing attention to the following points: (1) The great importance of the careful treatment of the third stage of labor, and unceasing control of the uterus from just before the commencement of this stage of labor until it is concluded, and afterward if necessary. (2) The binder in many cases is a luxury, and superfluous. (3) The advantages of 3 ligatures on the umbilical cord, with some precautions to be observed in their application. (4) That Credé's method of expression relates only to the first step of the third stage. (5) That traction (*vis a fronte*) is as good as, if not preferable to, "detrusion" in the second step of the third stage. (6) That an ideal and perfectly satisfactory treatment for the third and last step of the third stage has yet to be described. The third ligature he applies to the cord close to the vulva to act as an index that the placenta has left the uterus and is lying in the vagina. The cord is first drawn taut to open any coils that may be in the vagina, and care must be taken that the placenta is not already in the vagina when the ligature is applied. [It seems to us that this is one ligature too many, and merely adds to the duration of the process.] There are 4 indications that the placenta has left the uterine cavity: namely, (1) the fundus uteri occupies a slightly higher level in the abdominal cavity than it did at the end of the second stage; (2) the uterus becomes distinctly flattened from before backward; (3) the uterus becomes more easily movable in the abdominal cavity; (4) there is a distinct bulging forward of the abdominal parietes just above the symphysis pubis, appearing to the eye like a distended bladder and hav-

¹ Brit. Med. Jour., May 5, 1900.

² Dublin Med. Jour., Dec., 1899.

ing a spongy or boggy feel. H. Jellett¹ emphasizes the importance of rightly using the term "Dublin method" of effecting the delivery of the placenta. He states that this term is correct only in describing that method by which the delivery of the placenta is effected by external manipulations, as opposed to its manual removal or to its delivery by traction upon the funis.

Budberg² recommends the following modification of Credé's method of expelling the placenta: The patient's attention should be distracted in order to secure relaxation of the abdominal muscles. After slight rubbing movements, the hand of the obstetrician sinks gradually deeper until it grasps the fundus as much on the posterior wall as possible, the thumb being directed forward. With the other hand the lower portion of the uterus is seized in such a manner that the ulnar edge of the palm lies against the symphysis. Expression should begin with a pain and increase during its continuance. The two hands should be pressed together, harder and harder as the pain increases, and as it passes over the pressure should be gradually lessened, and not suddenly removed, even though the placenta is expelled in the mean time. With the upper hand rubbing movements are to be made as they were made at first. It is claimed for this method of expression that it does not move the uterus out of its normal position, but rather fixes it in that position, so that there is no danger of tearing the ligaments or the peritoneum of Douglas' pouch, nor is inversion of the uterus possible. This method of expression also empties the urinary bladder.

The Umbilicus; Its Development and Deformities.—A. E. Gallant³ states that out of 4832 children seen at the Good Samaritan Dispensary in the service of the late Dr. Van Arsdale, hernia of the cord had been encountered in 1 case at 6 months, and acquired hernia in 216. Of these hernia patients, 144 had been under 1 year of age. Deformities of the umbilicus might arise from retrograde changes in the umbilical vesicles and omphalomesenteric duct. There might be incomplete retraction of the abdominal viscera into the abdomen, arrest of development of the abdominal plates, or abnormal attachment of the cord to the umbilical ring. The omphalomesenteric duct might remain patent in any portion of its length. It was a portion of the original umbilical vesicle extending from the skin to the intestine. It might be present as a blind sac—a true Meckel's diverticulum. The duct might remain open, discharging mucus from a sinus of varying depth. When the intestinal end was closed and the end of the skin was open, there would be only a discharge of mucus; when both ends were open, the feces would be discharged at the umbilicus. One author had stated that in the majority of males the urachus was partly open. The part most likely to dilate was that near the bladder, because this was the portion which was the last to lose its function. Ring fistula at the umbilicus was the result of applying a ligature too close to the abdomen. Urachal fistula might arise from some obstruction to the usual and natural chan-

¹ Dublin J. M. Sc., June, 1900.

² Centralbl. f. Gyn., July 29, 1899.

³ Med. Rec., Nov. 11, 1899.

nel for the escape of the urine. In one case cited a marked phimosis had been the cause, as proved by the fact that shortly after the performance of circumcision the urachal fistula had closed. The fistula had been satisfactorily closed by the use of a subcutaneous ligature and a subsequent paring and uniting of the edges. A distended urachus not communicating with the bladder might open and discharge from the umbilicus. An extremely rare form of deformity had been described under the name of "amniotic umbilicus." It was characterized by the absence of skin around the umbilicus, its place being taken by the sheath of the cord. The most common variety of urachal deformity was that known as urachal cyst, or the *tubulo-cyst* of Bland-Sutton. Such cysts might remain throughout life without giving rise to any symptoms. They might remain at the vesical end. Last, but not least, is umbilical hernia. This might be either congenital or acquired. In the new-born herniotomy should be performed as soon as possible. Adherent, irreducible, congenital hernia is sometimes met soon after birth. As soon as the diagnosis has been made laparotomy should be done if taxis fails. The acquired form arises from the giving way of the parts subsequent to the healing of the umbilicus. The tumor is covered with peritoneum and skin; coughing and straining efforts of other kinds are quite commonly responsible for its development. When mechanical means fail, radical operation is demanded. The contents of the sac should be reduced, the umbilicus inverted, and then a pad applied. This pad should be made of a flat piece of pasteboard covered with adhesive plaster, and it should be retained in place by plaster strapping. The most important point in the application of this dressing is to bring together the integument over the inverted umbilicus and hold it there by covering the pasteboard pad with plaster, the sticky side of the latter being next the skin. The dressing should be renewed every 2 or 3 months. The chief principles to be observed in the **treatment of the navel following birth**, according to F. Ahlfeld,¹ are shortening of the cord to the recognized minimum, touching up the stump and vicinity of the navel with 95 % alcohol, then placing a layer of sterilized cotton, which is to remain on for 5 or 6 days, being removed only in case of its becoming moist with urine. Especially may it be noted that after the birth of the child the cord is to be cut about 3 or 4 inches from the navel, after carefully tying it with linen tape. Then, after the bath, the secondary shortening is to be performed. This consists in cutting off the cord about $\frac{2}{3}$ of an inch from the navel, and a little beyond this the cut is made. Now the aforementioned moistening with alcohol is to be done and the sterile cotton wrapped over it. The author never uses silk ligatures for tying off the cord, as it frequently happens that a hematoma of the cord follows a too tightly applied silk thread. The suggestion that a cautery scissors be used to cut off the cord about $\frac{1}{2}$ of an inch from the child's abdomen Ahlfeld scores as being too dangerous in its application. The latter is the method recently suggested by A. Martin.²

¹ Centralbl. f. Gyn., No. 13, p. 337, Mar. 31, 1900.

² Berl. klin. Woch., No. 8, 1900.

Porak¹ reports that he has reduced infantile mortality from 10 % to 3 % since he has adopted **omphalotripsy** or forcipressure in the treatment of the cord instead of the ligature. Umbilical infection is far more prevalent than is generally understood. He uses a wide crushing forceps, which flattens out the cord to the skin level. The result is a rapid desiccation. Dickinson² makes a plea for the **application** in amputation of the cord of the **surgical principles** that govern other amputations. The method used by him is to snip the cord with blunt-pointed scissors all around the skin margin. The sheath and gelatin are stripped backward with as much jelly as possible, leaving the vessels standing alone, and a fine silk or catgut ligature is put around. The vessels are cut off short and the stump tends to roll in. The stump may or may not be sutured. A dry gauze pad suffices for the dressing. Objections to complete primary amputations are: (1) Increased danger of contact infection, owing to operation on parts supplied with lymphatics, as compared with the ordinary ligation of vessels and jelly on parts having no nutrient capillaries or absorbents; (2) lack of drainage in case of infection; (3) the danger of concealed secondary hemorrhage (hematoma) after the suturing method; (4) inaccessibility of the vessel-ends in case of bleeding as compared with the facile placing of a second ligature when the stump is long; (5) the risk of striking an umbilical hernia; (6) as this is surgery, it is not yet adapted to the general practitioner.

MATERNAL DYSTOCIA.

Puerperal Eclampsia.—*Signals of the Pre-eclamptic State.*—Jewett³ says that the chief renal symptoms associated with the pre-eclamptic state relate to albuminuria, diminished urea excretion, and scant quantity of urine. *Albuminuria:* The precise value of the presence of albumin in the urine has not been definitely determined. It is agreed that albuminuria exists before the first convulsion in from 84 % to 91 % of cases. This particular signal of approaching danger is an especially valuable one, because of the facility with which it may be detected. As a diagnostic measure this would not be so bad but for the fact that the examinations, as a rule, are made at long intervals. If made twice each week, in the majority of cases sufficiently early warning would be given for the institution of remedial measures. In the writer's experience albumin is found in the urine even more frequently in these cases than is indicated by the foregoing figures. In his private practice true eclampsia has never been associated with the persistent absence of albuminuria. *Urea:* Urea is a valuable clinical index to the excretory activity of the kidneys, and one may usually feel secure as long as the urea excretion is near the normal. Notable diminution of this constituent should always excite suspicion, and a marked falling-off is usually of grave import. *Quantity of Urine:* This is especially useful as a clinical guide, since it is a matter that can be trusted largely to the

¹ Rev. méd., May 31, 1899.

² Trans. Am. Gyn. Soc., 1899.

³ Brooklyn Med. Jour., Aug., 1899.

patient's own observation. If the quantity remains above 3 pints in the 24 hours, eclampsia is a very great rarity. There may be a chronic nephrosis in which the quantity of urine is large, but eclampsia in such cases is infrequent, unless an acute lesion supervenes upon the chronic. The importance of quantity as a signal relates especially to the patient in whom there has been no preexisting nephritis. Even in the presence of albuminuria and diminished urea excretion, eclampsia will not occur as long as a volume of urine can be maintained—about 70 ounces in 24 hours. The quantity of toxic material which passes off in the urine is not measured by the percentage of urea elimination. An excessive flow of urine can usually be trusted to rid the tissues of the eclamptic poison, even though the urea be diminished.

Etiology of Eclampsia.—[It is now becoming very generally recognized that eclampsia is but a manifestation of a general toxemia, the origin of which is in the liver, gastro-intestinal tract, and kidneys.] E. P. Davis¹ states that the weight of evidence is distinctly in favor of the belief that a profound toxemia originating within the bodies of mother and fetus is the cause of eclampsia. The postmortem changes are degeneration of the cell-protoplasm in the liver, mainly around the central vein of each lobule, degeneration of the epithelium of the convoluted tubules of the kidneys, and hemorrhages in the placenta. Attention is called to the importance of the liver in this connection. The urine of eclamptics injected into animals is but feebly toxic, while the urine of healthy individuals is often highly toxic. But this is because the toxins of eclampsia, while absent from the urine, are retained in the blood-serum and in the organs of the body. If the urine were toxic, the patient would get rid of the poison, and would not be intoxicated. The serum of eclamptics is highly poisonous to animals. It is difficult to obtain the serum of patients threatened with eclampsia for examination, nor is it easy to determine the toxicity of the urine; but we have in urea a substance which serves as a sort of clinical index to the metabolism of the body. Though not itself a poison, its excretion corresponds to that of the poisons concerned, and diminution in the quantity of urea excreted indicates that toxins are being retained. The pregnant patient rarely excretes a normal amount of urea, but less than 1.5% is suggestive of impending eclampsia. Some idea of the amount excreted may be formed by multiplying the last two figures of the specific gravity of the urine by the factor 2.33, which gives approximately the total solids excreted. If this is low, the total daily urine should be measured and the daily urea estimated by a reliable method. The presence of sediment calls for microscopic examination. Apart from investigation of the urine, jaundice is an especially grave symptom. The skin, the intestine, and the lungs must receive full attention to ascertain the part they are playing in elimination. The nervous system is profoundly affected by the poison. Neuralgia, ptialism, pruritus, nausea, insomnia, skin-pigmentation, eruptions, and excessive sweating have all been traced to the same source, and melancholia and mania belong to the same train of symptoms. Abuladse,²

¹ Am. Gyn. and Obst. Jour., July, 1899.

² Monatsch. f. Geburtsh. u. Gynäk., Sept., 1899.

after studying 59 cases of eclampsia in the Imperial Maternity at Kieff, is inclined to doubt Stroganoff's theory that the disease is infectious. The latter authority certainly based his doctrine on 1500 collected cases. But the chief fact brought forward to support it was the frequent admission of 2 or 3 more cases of eclampsia after the admission of a first case, when previously no cases had been admitted into the same maternity for months. Such evidence is never trustworthy. On the other hand, Abuladse watched all his 59 cases himself; he had recorded the presence of several eclamptic patients in the same ward at the same time, but all of them—and, indeed, nearly every case in the whole series—already had marked symptoms when admitted; that is to say, they at least had headache, nausea, vertigo, vomiting, disordered vision, edema, albuminuria, and renal casts. Still more convincing is the fact that not a single lying-in woman in any of the wards into which one or several of the cases of eclampsia were admitted contracted this disease, which, in fact, can not be contracted. Abuladse insists that eclampsia is a primary disease of the kidneys due solely to autoinfection of the patient by the accumulation of waste products in the maternal and fetal blood. It is essentially a disease of pregnancy, not of parturition, and it always tends to interrupt gestation. [A study of the pathology of eclampsia would exclude all thought of an infectious origin.]

Pathology of Eclampsia.—Auglade and Poux,¹ at the Congress of Alienists and Neurologists held at Marseilles, April, 1899, gave an account of the pathologic changes produced in the cells of the cerebral cortex in eclampsia. A woman suffering from eclampsia had a series of attacks (30 in 2 days), after which she succumbed. Specimens of the cerebral cortex were taken at the necropsy, and prepared by the various methods, including that of Nissl, and the following changes were noticed: (1) Alteration of the pyramidal cells, with the presence around them of abnormal cellular elements. The alterations of the pyramidal cells were of two kinds: namely, a disappearance of the chromatic granules of Nissl—corresponding evidently to an exhaustion of the cell—and a marked deformation or distortion of the cell. (2) The small cellular elements were increased in number, and immediately surrounding the pyramidal cells were rounded in form and deeply colored. They showed nothing abnormal here except their number (they are said to have been observed in chronic chorea also, and the symptoms of this condition have been attributed to them). (3) Besides these, there were other cells, round or oval in appearance, more voluminous, and less strongly stained, and possessed of distinct outline and with granular contents. One, or perhaps two, large grains represent the nucleus of these cells. They also surround and lie against the pyramidal cells, and seem to occupy the space once occupied by dying or dead pyramidal cells. These cells are found only in the cortex of those dying of epileptic attacks; and it is a question whether they are leukocytes which have emigrated from the vessels, or whether they are enlarged "protoplasmic glia cells" of the type described by Andriezen. Lugaro seems to incline to the latter

¹ Arch. de Neurol., June, 1899.

view. Friebe¹ demonstrated before a Hamburg society two livers from fatal cases of eclampsia. There were specks of blood under the serous coat and in the deeper part of the parenchyma. The microscope showed that each speck represented an anemic area and a hyperemic area with necrotic patches. These liver changes, Friebe insists, were quite secondary, being due to the mechanical effects of the convulsions. In both cases acute parenchymatous nephritis was present. The alleged embolic deposits of placental cells in the liver were always secondary. Red marrow-cells and liver-cells have been known to become transferred from their natural seats in other diseases.

Symptomatology of Eclampsia.—C. B. Reed² states that the clinical history of eclampsia is that of a toxemia. According to Zweifel, multiple thromboses are invariably found postmortem in the liver, lungs, and brain, which would indicate the presence in the circulation of some product of organic change with blood-coagulating power. It has been shown by Chambrelent's experiments that the toxicity of the blood is increased in both mother and child when the former presents eclamptic symptoms. As Kaltenbach says, "the prodromata, gastric and cerebral symptoms, the rapid occurrence of serious disturbance of the brain, the postmortem increase of temperature, the nature and frequency of the nervous disorders that follow and find their analogy in the neuroses consequent upon typhus and diphtheria, probably caused by toxalbumins, are scarcely to be explained unless by the theory of blood-poisoning." Toxins spend their powers largely upon the nervous system; and in proportion to the development of the nervous system their effects become perilous. Jaundice is not only a symptom of acute yellow atrophy of the liver, but is to be found also in a certain proportion of eclamptic cases, thus indicating again the rôle of the liver in the production of this disease. J. D. Voorhees³ reports a case of eclampsia complicated by a marked **erythema multiforme**. This resulted, probably, from a toxin elaborated in the liver. [Kaposi groups the causes of this skin disease under 4 headings: Cases due to (a) changes of seasons; (b) angioneuroses which occur principally in women; (c) instability of the vasomotor centers; (d) autoinfection—i.e., toxic substances which have entered the blood as the result of some internal disease, such as chronic nephritis.] H. Savory⁴ has collected notes of 64 published cases of eclampsia, and states that copremia frequently accompanies the eclamptic seizures. He also mentions several recoveries in which purgation was the only form of treatment adopted.

Treatment of Puerperal Eclampsia.—Charles⁵ notes that, notwithstanding our knowledge and experience, puerperal eclampsia still kills about one-fourth of the women attacked and half the children. Subtracting from cases in general all deaths during delivery; which are relatively few, and all deaths after delivery, which are fewer still, Charles finds the proportionate mortality before delivery so high that a

¹ Monatsch. f. Geburtsh. u. Gynäk., May, 1899.

² Medicine, Oct., 1899.

³ Med. Rec., Oct. 7, 1899.

⁴ Brit. Med. Jour., July 15, 1899.

⁵ Jour. d'Accouchements, April 15, 1900.

woman with convulsions at the seventh or eighth month is in as great danger as though she had Asiatic cholera. Treatment will probably save her, but the best line of treatment is not certain. Halbertsma, von Döderlein, Hubert, of Louvain, and others advocate cesarean section as a speedy and thorough treatment. Not only is such treatment out of the question in many cases, but, Charles adds, it is supported by its advocates on questionable grounds; thus, Hubert prefers it to induced labor because the cervix is usually irritable, so that handling it excites fresh convulsions. Charles and others deny, on experience, that the cervix is dangerously irritable. Hubert successfully performed cesarean section in one case in which no fits had occurred, mainly on the ground that blindness had set in and the urine was highly albuminous. Charles prefers for all cases medicinal treatment, and then induction of labor. R. C. Norris¹ discusses the *preventive treatment* of eclampsia. Good pulmonary ventilation and a diet of easily digested, readily oxidized, nonconstipating, nontoxic food must be secured. Moderate outdoor exercise, the avoidance of compression of the waist by the corset, frequent bathing, and the selection of proper underwear are strongly urged. The advantage of calomel as a laxative is very great, since it is probably the best intestinal antiseptic, besides acting on the liver, the organ which specially requires attention. For graver cases showing marked toxemia, with the percentage of urea diminished below 1, the specific gravity of the urine below 1010, and the quantity of urine reduced to 800 gm. or 1000 gm. (about 1½ pints) a day, the most active treatment is demanded. Rest in bed and an exclusive milk diet, with the use of mercurial and saline purgatives, are necessary. Digitalis, diuretin, benzoic acid, and other drugs have been used for their diuretic effect; and Norris is convinced that the more rational plan is to rely upon mechanical diuretics, such as an abundance of pure drinking-water and rectal injections of salt solution, and also upon elimination by the skin and bowels. Termination of pregnancy should be secured if the treatment just outlined does not cause definite improvement in the course of one or two weeks. Eliminative treatment must be continued after the uterus has been emptied. [According to Descheemacker, saccharin, prescribed at the rate of 1 gm. or 2 gm. a day, should prove a most efficient intestinal antiseptic in these cases. Cathartics, however, are more efficient than the latter class of medicines.] G. E. Herman² believes that much of the mortality of puerperal eclampsia comes from the pernicious maxim, "Deliver as quickly as possible." Eclampsia depends upon a disease of the kidney peculiar to pregnancy; and for its prevention labor should be induced as soon as any considerable amount of albumin is found in the urine, and other treatment has not been effective. But when the acute disease—characterized by fits and urine solid with albumin—is established, the time for prevention has passed. The disease will run its course, and this course is not affected by delivery. Some cases end in recovery without delivery; others get worse after delivery. There is abundant evidence that delivery has no

¹ Therap. Gaz., Dec. 15, 1899.

² Jour. Am. Med. Assoc., April 28, 1900.

favorable effect on the disease. Forced delivery has many bad effects. Manipulations provoke fits. Dragging the child through an imperfectly dilated genital passage involves tearing of the parts. Pulling the child away when the uterus is not contracted surely leads to postpartum hemorrhage. Cesarean section has been proposed; and the hastening of delivery by freely cutting open the cervix, vagina, and vulva (Dührssen). Such measures have no justification unless immediate delivery greatly benefits the patient, and it does not. The right course is to let the labor go on with the least possible interference. Let the uterus do its work, and interfere only if some condition be present which makes natural delivery impossible. Jardine¹ reports 5 cases of eclampsia, in addition to 17 previously reported, treated with *saline infusions*, in which the diuretic effect had been prompt and marked. The solution used consisted of one dram each of sodium chlorid and sodium acetate to the pint of sterile water. From 2 to 3 pints were injected underneath the breasts, between them and the chest-wall, or, if required, into the loose abdominal subcutaneous tissue. If necessary the injections are repeated. Besides, a saline purge is administered, sometimes with bromid and chloral and 10 minims of tincture of veratrum viride by hypodermic injection. Of the 22 patients, 6 died; 1 from perforating duodenal ulcer. One was treated with ordinary saline solutions. [This result compares favorably with that yielded by other lines of treatment for eclampsia, especially in view of the fact that many of the patients had been seized with convulsions several hours before coming under observation, and the cases of some even had been considered hopeless.] No risk attends the infusion, and not a single abscess followed not less than 200 injections. Strict aseptic precautions must be observed.

Contracted Pelvis.—E. P. Davis² contributes the result of his examination of the records of 1224 patients who were examined by pelvimetry and palpation, both external and internal. These were of all races inhabiting the United States, except Chinese and Indians. A few years ago it was commonly believed that abnormal pelvis were rare in America, but when pelvimetry was regularly practised in obstetric clinics, it was at once observed that a very considerable number of patients presented themselves whose pelvis were contracted or in some dimension differed from the average. The records of European clinics show a variation in percentages reported from 1.2 in Russian clinics, to 24.3 as observed by Leopold, of Dresden. Among American observers, Flint, in New York, found 1.42% of contractions; Reynolds, in Boston, 1.13%; Crossen, in St. Louis, 7%; Dobbin, in Baltimore, 11.45%; and Williams, in Baltimore, 13.1%. The average size of the pelvis upon which the 1224 records of Davis were based was: Anterior superior spines, 24 cm. to 26½ cm.; crests, 28½ cm.; trochanters, 32 cm.; right oblique diameter, 22½ cm.; left oblique, 21 cm. to 22½ cm.; internal conjugate, 11½ cm.; external conjugate, 20½ cm.; circumference, 85 cm. to 90 cm. A variation from the average measurement of 2 cm. in the anteroposterior diameter, or of 2 cm. in any other two diameters,

¹ Lancet, Mar. 31, 1900.

² Am. Jour. Obst., Jan., 1900.

was considered an abnormality. The most frequent abnormality was contraction of the pelvis. The justominor was the most common type, being 13% of all forms of contraction; the rachitic came next, 6%; next the flat nonrachitic, 5.7%; and most rare, the obliquely and irregular contracted, 0.2 of 1%. The justomajor or symmetrically enlarged pubis was found in 7% of abnormalities. Of the 1224 cases, 32% showed abnormalities: viz., 392. The percentage of contracted pelvises was 25, corresponding closely to Leopold's statistics. The paramount interest attaching to this subject lies in the influence which pelvic abnormality exerts upon labor and the life and health of mother and child. It is of interest to observe in what percentage of all classes of cases having normal and abnormal pelvis labor is spontaneous. In this series 84% of labors terminated spontaneously, leaving 16% that required operative interference. Comparing this result with the course of labor in abnormal pelvis, we find that in cases of pelvic abnormality 80% of labors were spontaneous and 20% required interference. It must not be understood that in a series of highly contracted pelvises 80% of labors would be spontaneous, but it is undoubtedly true that in a very considerable number of cases (most of them contracted) labor terminates without operative interference. Davis concludes that among child-bearing women of the white and negro races in the United States, 25% have pelvises smaller than the average, and 7% have pelvises larger than the average. Of patients having abnormal pelvises, 80% deliver themselves spontaneously. The operations most suitable for well-marked pelvic contraction, and most successful for mother and child, are the induction of premature labor, symphysiotomy, and cesarean section when the mother is uninfected and the child is in good condition. Embryotomy should be chosen when the mother is infected and when the child is dead or likely to die. The general mortality rate and the septic mortality rate of all classes of labor and of labor in abnormal pelvis compare favorably with the results obtained by modern medicine and surgery when obstetric practice is conducted in accordance with modern scientific knowledge of the subject.

R. E. Cutts¹ says that some common causes producing dystocia are: (1) Obliquity of the plane of the superior strait of the pelvis to the axis of the body. (2) Lordosis of the lumbar vertebræ, and more particularly the undue prominence of the last lumbar vertebræ. (3) The condition of the pubes. (a) *Obliquity of the plane of the pubes to the plane of the superior strait of the pelvis*: Normally, the pubis is placed at about a right angle to this plane, but there may be a tilting of the superior part of the pubes toward the sacrum, causing a narrowed inlet, or the same condition of the inferior part of the pubes, causing a diminution of the diameter of the inferior strait. With the first, there is interference with the engagement of the presenting part, but after this point delivery is easy and rapid. With the latter the engagement may be easy and the presenting part reach a point near the vulva, but here it will be held between the lower margin of the pubes and the sacrum, and unless

¹ Ann. of Gyn. and Ped., Sept., 1899.

the uterine contractions are strong, low or medium forceps will have to be applied. (b) *Length of the pubes and subpubic ligament*: This varies from 1 inch to 3 inches. With the long pubes the difficulty in delivery is encountered in the middle and lower part of the pelvic canal, and when accompanied with the condition previously mentioned, in which the lower part of the pubes is inclined toward the sacrum, may produce severe dystocia. (c) *Thickness of the pubes*: This usually occurs in women of stout build and heavy bones. In connection with the thick pubes there may be a cartilaginous ridge over the symphysis as thick as $\frac{1}{4}$ of an inch. In measuring a pelvis these points must be considered, else an external conjugate measurement might be misleading.

Pregnancy Following Fixation of the Uterus.—Rühl¹ calls attention to the severe labor complications which may follow both vaginal fixation of the uterus and ventrofixation. The predisposition is greatest in the vaginal operation when the top of the uterine body is fixed to the anterior vaginal wall; and in the abdominal operation when the fundus itself is immovably fixed close above the symphysis. The obstruction to labor may be so serious that although the pelvis be of normal dimensions, cesarean section may be required. In passing, he calls attention to the fact that cesarean section, when performed for this cause, has been attended with a very high mortality, amounting to 50%. In a normal pregnancy at the fortieth week the long axis of the uterus lies exactly at right angles to the plane of the pelvic inlet. In the pathologic conditions under consideration the fundus is fixed much lower than it should be, while the cervix is drawn up and retroposed, with the result that the uterine axis may make an angle of only about 40 degrees with the plane of the inlet. When the uterine contractions occur under these conditions, the tendency is for the presenting part of the child to be driven backward against the sacrum, instead of downward and backward in the pelvic axis. The cervix may be drawn so far up and back as to lie above the level of the sacral promontory, and the true pelvis may be bridged over by the anterior wall of the uterus and vagina in such a way as to leave between the anterior lip of the cervix and the sacrum no room for the passage of the child or for the manipulations necessary for artificial delivery. In these cases the author advocates an anterior uterovaginal section, consisting of an incision passing through the anterior lip of the cervix, the anterior uterine wall, and vagina. Special care is needed to avoid injury to the bladder. As much natural dilation of the cervix as possible should be obtained before making the incision.

Hour-glass Contraction of the Membranes in the First Stage of Labor.—Tucker² reports and tabulates 5 cases of this condition observed in 3000 consecutive confinements, of which 50 were abortions, and 350 more or less premature labors. The apparent frequency, therefore, might be regarded as 5 in 400, or 1 in 80, if we consider only the premature labors; but if we assume that this phenomenon may occur at term under favoring circumstances, the frequency must be changed to 5

¹ Centralbl. f. Gyn., No. 51, 1899.

² Am. Gyn. and Obst. Jour., July, 1899.

in 3000, or 1 in 600. Tucker's 5 cases are carefully tabulated. It is significant that in 4 of those 5 the obstetrician fell into the usual error—a wrong diagnosis of the second stage being made at the time of the first examination; in reality, the first stage did not end until several hours later. The ages of the 5 patients ranged from 20 to 41 years. Six factors were uniformly present in all the 5 cases; and without the existence of all six in every case, the phenomenon, in Tucker's opinion, could not have been produced. These factors are: (1) A partly opened cervix. Labor must begin and the cervix must be more or less dilated before "constriction of the membranes" can be established. (2) Resistance of the cervix. Unless it offers resistance owing to rigidity or thickness, a constriction of the entire bag of waters into two smaller bags can not be made. (3) Nonengagement of the presenting part. In all 5 cases the presenting part, though different in every case, failed for some reason to fit into the pelvic brim tightly enough to prevent the liquor amnii from passing freely down into that part of the bag of waters which lay at first in front of the presenting part, and which protruded later through the cervix and became the vaginal bag. (4) Separation of the chorion. Unless the chorion becomes detached from the lower uterine zone, extension of the membranes through the cervix to form the vaginal bag could not take place, even if all the other conditions were favorable. (5) Tough membranes. Unless the membranes are strong enough to resist rupture in spite of uterine contractions of considerable severity until the vagina is completely filled by a bag of waters, "hour-glass constriction of the membranes" can not be established. (6) Uterine contractions. Labor must have advanced far enough to have partly dilated the cervix, and some separation of the chorion from around the internal os must have taken place before the pains begin to be effectual in forming the vaginal bag. Then the uterus acts at each pain like a bulb-syringe in forcing the liquor amnii through the cervix into the vaginal bag, which increases in size with every pain.

Inversion of the Uterus.—According to J. W. Taylor,¹ three methods of treatment for this accident are worthy of recognition. The first is manual reduction. This is applicable only to the period immediately following displacement. The fingers of the accoucheur (carefully cleaned and sterilized) grasp the inverted fundus and aim at reposition by pushing back or returning, not the inverted fundus, but the inverted wall of the uterus, which has come down last. If this be started back, the fundus returns easily. This method should always be used at the time of confinement when inversion follows the removal of the placenta. It is then peculiarly suitable and efficacious, but the time when it may be used with safety is strictly limited to the period immediately following displacement. The second method, that of reposition by elastic pressure, is suited for the greater bulk of cases which are seen at some period shortly removed from the confinement when the displacement is becoming chronic, but the inverted uterus is still large, soft, and congested. The third method, that of operation by

¹ Birmingham Med. Rev., Aug., 1899.

the method of Küstner or of Dührssen, is suited for still more chronic cases in which elastic pressure has been tried unsuccessfully, and in which, in spite of the inversion, involution of the uterus is sufficiently far advanced to admit of operative work on the cervix and cup of the inversion ring. Hirst¹ recommends the **removal of the obstruction**

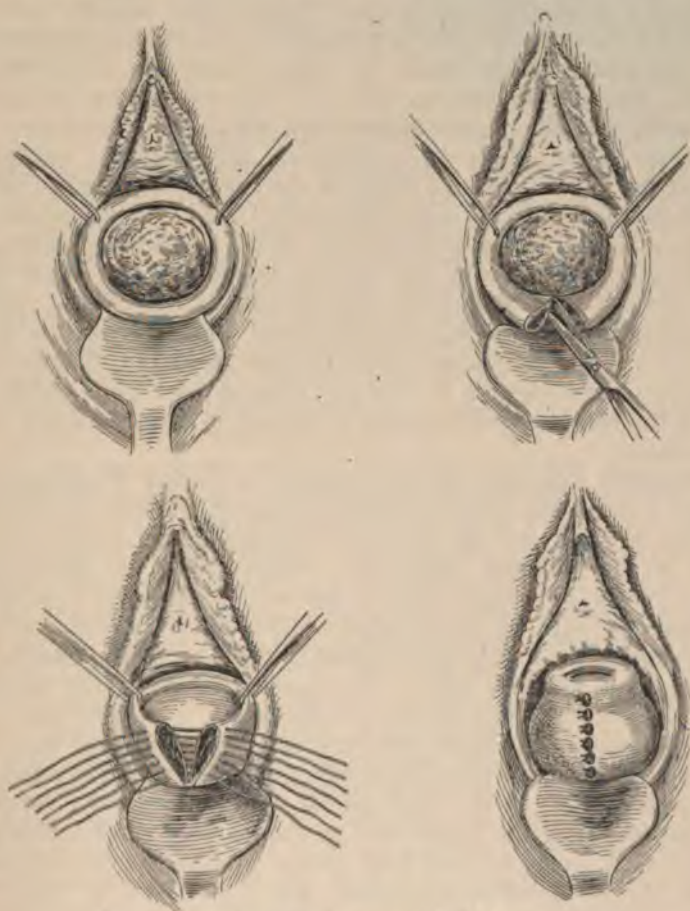


Fig. 58.—A new operation for inversion of the uterus (Hirst).

in persistent inversion of the uterus by cutting the cervical muscle in two, which can be done in a few seconds, without opening the peritoneal cavity, without danger, and with the result of immediately removing the only obstacle to replacement. The incision is made in the median line posteriorly, and is carried higher on the internal than on the external surface. Comparatively light pressure with one finger-tip on the lower uterine segment just above the upper angle of the wound will now readily reinvert the uterus.

¹Am. Jour. Obst., Jan., 1900.

FETAL DYSTOCIA.

Causes of Twin Pregnancies.—D. Ghelline¹ observes that twin pregnancy in a single ovum occurs only once in 700 ordinary deliveries, while other twin pregnancies are noted in 90, on an average. The frequency of malformations in the uniovular twin pregnancies also indicates that it is an abnormal process. Multiovular vesicles can not be considered the cause of multiple gestation,—two ripe ovules have never been noted in a single vesicle in woman,—and even in multiparous animals, multiovular vesicles are rare and the number of ovules is always less than the number of the litter. There is in animals a difference between the ovaries of multiparous and uniparous females. In the first the specific ovigenic tissue of the ovary predominates, while in the others the stroma is more abundant. Twin pregnancy can therefore be attributed to the predominance of the germinal epithelium over the stroma. The more ovules and the less stroma, the more vesicles ripen and the more frequently they burst. If this law is true, twin pregnancies should accompany multiparity, which is what is actually observed. From the biologic point of view, therefore, Ghelline asserts that twin pregnancies are an atavistic phenomenon, while single pregnancies indicate the predominance of stroma, a more advanced stage of development.

Posterior Rotation of the Occiput in Vertex Presentation.—Stricker Coles² has issued a valuable paper of statistics on 30 cases of posterior rotation out of 925 vertex presentations observed in 975 labors in the Jefferson Maternity, Philadelphia. He is inclined to except 2 cases in which delivery was accomplished by high forceps; the head was high up in the right oblique diameter, with the occiput behind, and as the forceps was applied to the sides of the head, anterior rotation could not take place. The percentage of anterior rotation of the occiput when it was behind, in these cases, is very difficult to estimate, as many of the cases were not seen until rotation was already complete. The factor most commonly producing posterior rotation was incomplete flexion as the head passed down through the pelvis; the occipital end being the largest and passing through the smallest part of the pelvis, it seems to meet with greater resistance; the sinciput becoming the most dependent portion, this would tend to rotate posteriorly. Three cases were converted into anterior position, and labor proceeded normally. This was done by increasing flexion and grasping the head between the thumb and fingers, placing the patient on the side toward which the occiput pointed, or in the knee-chest position; and, by external manipulation at the same time, the head was rotated anteriorly, the patient then placed on her back, and labor allowed to proceed normally. In 5 cases, after the foregoing maneuver, the forceps was needed. In 15 cases the head was delivered in the occipitoposterior position with forceps. Version was performed once. In 6 cases delivery took place without interference, with the occiput lying posterior; in

¹ Jour. Am. Med. Assoc., Jan. 6, 1900.

² Am. Jour. Obst., Sept., 1899.

4 of the 6 cases the mothers were multiparæ "with very poor pelvic floors," due to previous lacerations, and in 2 the mother was a primipara with a large pelvis and the child was not above the average. The perineum was torn in 12 cases, the pelvic floor in 6, and the cervix in 5. All the mothers made good recoveries; 2 had slight postpartum hemorrhage and in 3 there was some elevation of temperature. Two children were lost. One had been dead for some time; the second, delivered with forceps, was badly asphyxiated, was revived, but died an hour and a half later.

OBSTETRIC OPERATIONS.

Forceps.—M. Campbell¹ observes that whatever the theories of practitioners might be as to the proper use of the midwifery forceps, there could be no question that the invention of forceps was the greatest advance in the obstetric art up to the beginning of the seventeenth century. It could be pictured what practice must have been without them by the study of the older books on midwifery, when the instruments must have been in use tentatively for half a century. The practitioner could resort only to Paré's dreadful hooks or the "tire-tête" (involving certain death to the child and injury to the mother), or to the crotchet. The invention of the forceps was referred to, and their development down to the axis-traction forceps of modern days was traced. For a long time artificial aid was looked upon as the opprobrium of midwifery, and there was a real fear of blame to the surgeon whether the child was dead or born alive and injured. Writers of early times spoke of the midwife's strictures with awe, and dreaded to be called butchers. The patients, taught by the nurses, gave up hope when a surgeon was called in, so that it became common to use instruments secretly. Mauriceau quoted as a saying of his day, "When a man comes in, one or both must die." Smellie gave elaborate instructions as to how best to elude observation. The forceps were carried in the pockets, the patient was covered with a sheet, and the instruments were brought out under its cover and laid on the bed. Then, surreptitiously, under the sheet, they were introduced, used, and as secretly removed and returned dirty into the same pockets, all without the watchful midwife or the equally suspicious friends knowing aught that had been done. How different from modern practice, when the suggestion of artificial aid often comes from the patient or her anxious friends! The question as to when aid should be given was the subject of early controversy, and continues to be debated. After giving the opinions of many writers, Campbell alludes to his own practice by stating (1) that a prolonged first stage is always safe to mother and child, provided the membranes are intact and the presentation is natural; (2) that during that stage it is seldom necessary or advisable to give an anesthetic; (3) that if a malpresentation is diagnosed, it might be necessary to correct it by manipulation; or if the corrected presentation does not remain permanent, to rupture the membranes and

¹ *Lancet*, Oct. 14, 1899.

possibly to turn or to apply the long forceps; and (4) that exhaustion is sometimes found in a protracted first stage, especially when the waters are lost prematurely, and it might be needful to dilate and extract or to dilate in extracting by the forceps. When the second stage is fully entered upon and voluntary efforts accentuate the pains, an anesthetic (chloroform invariably) is given with the occurrence of each pain. If during an hour in multiparæ or during $1\frac{1}{2}$ hours in primiparæ there is evident progress, things are left to nature plus chloroform, pressing the chloroform only when the head stretches the perineum. If, however, during that time (1) no progress is made, (2) the mother's pulse becomes rapid, or (3) the child by its movements or its pulse shows signs of exhaustion, then he applies Braithwaite's short forceps and delivers. This form of instrument is extremely handy, very light, and can be applied with a minimum of fuss. It is possible to pass the blades without even bringing the patient to the edge of the bed—the lower blade first, then the upper posteriorly, and gradually edging it around; but this manœuver is seldom required. The head can be brought down slowly or quickly according to need, and when the head is on the perineum, the extracting power can be applied by the left hand between the patient's thighs with as little separation of the thighs as possible. He deprecates flexion and abduction of the thighs by the nurse, being convinced that the proceeding renders the perineum more tense and rupture more likely. When the vertex has well filled the vaginal orifice, he removes the forceps and allows nature to finish the labor, if the action is not too boisterous. If delay then occurs, a modified "Ritgen" manipulation, pressing "postanally" upon the face or chin, is employed. He does not look upon such a case as requiring an after-douche, unless for special causes, such as meconial discharge or a dead child, and is content to rely upon a boric acid or iodoform pessary inserted twice daily. He has conducted 243 such cases with the loss of 2 children and no maternal death. Consultation cases are excluded, in which, of course, the mortality is higher. He attacks the statement that "gynecology has become so largely surgical as the direct result of surgical interference in midwifery practice," made some time ago by a professor of midwifery, and produces opinions and statistics to controvert it. In conclusion, he states that with forceps many evils, immediate and remote, are avoided. With anesthesia forceps must be more frequently used, and with asepsis and antiseptics their safety is increasing day by day.

The Relative Indications of Symphysiotomy, Cesarean Section, and Craniotomy.—Leopold¹ offers the following conclusions: (1) *Before term*: When there has been one or more difficult labors, caused by pelvic deformity, premature induction of labor is indicated when the pelvis is not too much contracted (conjugata vera more than 7 cm. in the flattened pelvis, more than 7.5 cm. in the just minor pelvis). The best moment for intervention is the thirty-fifth week of pregnancy. Good results can not be expected unless the membranes remain intact and there is a head-presentation. (2) *At term*: Craniotomy

¹ Ann. of Gyn. and Ped., Aug., 1899.

is indicated (*a*) when the child is *dead* and labor does not advance, even when the pelvis is only slightly contracted; (*b*) when the child is in *danger*, the contracted pelvis being an obstacle for spontaneous birth, forceps and version being too dangerous or impossible. This rule is valuable equally for hospital and home practice. The danger to the mother is too great to risk cesarean section or symphysiotomy when it is not quite certain that a living child will be born. When the child is in *perfect condition*, craniotomy will be performed only as an exception in hospital practice; but in private practice it is indicated when spontaneous birth, forceps, and version are excluded and the termination of labor is necessary, the obstetrician, all circumstances duly considered, regarding cesarean section or symphysiotomy as too dangerous. The conjugata vera must be more than 6 cm. In exceptional cases, when for private reasons it is important that the child be born living, should it be only for some minutes, the advice of a colleague should be asked, and the family of the woman should be acquainted with all the dangers accompanying the operations by which the child can be saved. (3) The cesarean section has absolute or relative indications. In a pelvis with a conjugata vera of from 7.5 cm. to 6 cm. the indication is a relative one. When the diameter is less than 6 cm., the indication is an absolute one. Cesarean section on relative indications requires the fulfilment of the following conditions: A spontaneous birth being impossible, forceps and version inadmissible, the child in a perfect condition, and the woman either in a hospital or in circumstances quite as favorable as to the operation itself and as to the subsequent treatment. When the circumstances are not favorable enough, craniotomy of the living child is to be preferred. (4) Symphysiotomy is indicated only in a pelvis with a conjugata vera of from 7.5 cm. to 6.5 cm.; the indications are, therefore, much more limited than those of cesarean section, and do not regard the pelvis of the second class (a pelvis in which the conjugata vera is less than from 7 cm. to 7.5 cm., but more than 6 cm.). With this restriction, symphysiotomy may compete with cesarean section on relative indications, and requires the same conditions. When these conditions are not fulfilled, craniotomy must be performed. The choice between symphysiotomy and cesarean section, as relative indications, depends on the experience of the operator. The results of both operations, performed under the same conditions, are almost equal for the mother as well as for the child. Fancourt Barnes¹ considers that symphysiotomy has not justified its existence, and he believes that in a few years the eminent obstetricians who have been advocating it will abandon its use. Cesarean section, on the other hand, is a scientific and justifiable operation, and will be more widely resorted to in the future than it has been in the past. A. Giles² sums up his own views as follows: (1) Given a true conjugate of from 100 mm. to 85 mm.: forceps, version, or premature labor. The nearer the lower limit is approached, the stronger is the indication for premature labor. (2) Given a conjugate of from 85 mm. to 70 mm.: premature labor, symphysiotomy, or craniotomy. If elective, labor should be induced

¹ Ann. of Gyn. and Ped., Aug., 1899.² Lancet, Aug. 26, 1899.

prematurely; or if compelled to wait until term, symphysiotomy or craniotomy must be performed—symphysiotomy if the child is living, and craniotomy if the child is dead. (3) Given a conjugate of from 70 mm. to 55 mm.: symphysiotomy, cesarean section, or craniotomy. If the child is small, symphysiotomy is possible; if the child is large, cesarean section is inevitable; and if the child is dead, craniotomy is to be done. (4) Given a conjugate of from 55 mm. to 40 mm.: cesarean section is to be done whether the child is large or small, living or dead. The aim of all is that before long craniotomy of the living child will become a thing of the past. It is necessary that general practitioners should realize that symphysiotomy is quite within their province, so that if the patient is seen too late for the induction of premature labor, the child might be saved. On three questions there is practical unanimity of opinion: (1) In extreme degrees of contraction the proper course is cesarean section; (2) in all cases craniotomy of the living child should be avoided if possible; and (3) for minor degrees of contraction forceps or version is best. The chief point at issue is the choice between symphysiotomy and premature labor; and Giles' view is that if the patient be seen in time, the latter is preferable, in view of its much lower maternal mortality. P. Bar¹ states that the immediate dangers of the operation, such as shock, hemorrhage, etc., are greater in the case of cesarean section than in symphysiotomy; also, cesarean section, when performed aseptically, causes less risk than symphysiotomy, since the dangers due to the extraction of the child are entirely avoided. The remote dangers of cesarean section are also less serious than those of symphysiotomy. Hence cesarean section should be chosen in preference to symphysiotomy.

Cesarean Section.—[It is beginning to seem quite possible, owing to the increased knowledge of the technic of cesarean section, the comparative ease with which it is performed, and the low mortality rate, that operators may be led to resort to the operation in unsuitable cases, particularly those with possible septic infection, for which some other method of delivery would formerly have been found. We have considered that a dead child or a septic mother were almost positive contraindications to the cesarean operation; and if occurring with a pelvic tumor, the abdomen should be opened, the tumor removed, and the child delivered by forceps or craniotomy.] Doktor has collected from the literature of the subject 21 cases of cesarean operation in septic patients. A study of these cases leads to the following conclusions: The incision of the uterus, the extraction of its contents, and suture of the womb were followed by a mortality of 40%, while those patients that recovered had prolonged fever. A still worse result followed amputation of the uterus, with extraperitoneal treatment of the stump. The mortality of these cases was between 40% and 50%, and the patients who recovered suffered from pus formation in the stump and various septic complications. Those cases treated by amputation of the uterus with intrapelvic treatment of the stump did better than either of

¹ *Medicine*, Dec., 1899.

the foregoing. The mortality of this series was 14.27 %, and the morbidity embraced the complications of sepsis, as in the other methods of treatment. So far as the comparison goes, at this point the best results were obtained by amputation of the womb, with intraperitoneal treatment of the stump. It would, however, be most desirable to remove the septic womb and contents from the patient without contaminating the abdomen, if this could be done. This has been effected in 2 cases by total extirpation of the pregnant womb through the abdomen. In each of the reported cases the mother recovered without complications. [We must conclude from this interesting study that in cases of septic infection affording considerable risk in delivery through the vagina the womb and contents should, if possible, be removed without being opened in the body of the mother.]

PATHOLOGY OF THE PUERPERIUM.

Puerperal Sepsis.—Menge and Kroenig¹ contribute a paper giving the results of very interesting researches upon the various sorts of streptococci and their action in disease. [It is evident that while many bacteria have been isolated, we still lack positive information regarding the virulence of species and also the conditions which especially arouse these germs to fatal activity.] The writers have found that there are different forms of streptococci which in shape, arrangement, and facility in staining resemble one another very much, but which in culture, growth, and resisting power to the oxygen of the atmosphere show marked differences. These properties remain constant with the streptococci through repeated cultures, as well as in a single culture. When the resistance which these germs offer to the oxygen of the air is considered, they may be divided into two classes: First, are those anaerobic streptococci which behave uniformly under the usual conditions of their environment. The other class consists of those which take a different action under varying circumstances. The susceptibility of the first class of streptococci is very great. They flourish in liquid and in constant media only when present in large masses, which make sure the condition of anaerobiosis. Among these there are those streptococci which when grown upon artificial material produce decomposition with offensive odor. These same germs are sometimes found as saprophytes in the vaginal secretion. In the first class are also those which as genuine parasites invade the human organism and show considerable vigor. Other germs of this class are found in human connective tissue in purulent peritonitis. At the point where these germs take their origin they are usually found divided into the two classes described. Later in their development symbiosis is present, and both forms are found together. Both varieties of streptococci have been observed in the connective tissue of the human body in purulent parametritis, and in the local secretion from the uterus. In artificial culture-media it is also possible to produce the phenomena of symbiosis.

¹ Monatsch. f. Geburtsh. u. Gynäk., Bd. ix, Heft 6, 1899.

K. Franz¹ remarks that slight elevations of temperature during the puerperium are usually caused by saprophytes which gain access to the uterine cavity. The saprophytes themselves do not cause fever; it develops only when the outflow of the bacteria-containing secretion is prevented. The saprophytes which are found in the uterus in cases of slight elevations of temperature are probably identical with the saprophytes of the vagina. Internal examination is usually a factor in causing slight elevations of temperature only so far as it causes vaginal wounds which serve to further the development of the bacteria which are always present. Slight elevation of temperature occurs oftener by half in primiparæ than in multiparæ. Diminishing the duration of the third stage increases the number of slight elevations of temperature, while long duration of labor, especially of the expulsive stage, and premature rupture of the membranes, have but little influence in the production of these cases. [Puerperal fever is undoubtedly sometimes due to other germs than streptococci, and it is extremely probable that the diphtheria bacillus sometimes plays a rôle in the etiology of the disease. At times there is perhaps a mixed infection by these germs, as in the throat, and unless care is taken in culture methods, it might seem as though only the streptococcus were at work. In infections of the bladder *Bacillus coli communis* is so often the positive agent that one is tempted to wonder whether it plays a rôle in uterine infections also. Adhesions between the uterus or adnexa and the intestines often exist as a result of former inflammatory conditions, and by means of these, the wandering of intestinal bacteria like *Bacillus coli* is favored during the postpartum period, when extensive lymphatic absorption occurs. In addition, at this time the uterine tissues are being dissolved in the body-juices, and so furnish an excellent culture-material for the multiplication of micro-organisms. These facts would explain at the same time the origin of certain cases of so-called idiopathic infection.]

Treatment of Puerperal Sepsis.—Spencer² divides puerperal fevers into 4 classes. The first is that occurring about the third day, the temperature rising to 102° F. and yielding promptly to the administration of a purgative. When emotional causes are present, the temperature may be much higher, but promptly subsides. In the second class of puerperal fevers he places those caused by diseases having no connection with labor. Such are influenza, scarlatina, acute tuberculous infection, and typhoid. Influenza is, in his opinion, more frequently diagnosticated than actually found in the puerperal condition. In some cases, however, this condition is undoubtedly present. Scarlatina is very rare in the puerperal period, and most cases so diagnosticated are septic, with an anomalous rash. Acute phthisis is often mistaken in the puerperal period for pneumonia, as the physical signs correspond. It does not yield to treatment, and the discovery of the bacillus establishes the diagnosis. In typhoid the differential diagnosis may be difficult, and can often be established only by the use of the Widal test. In the third class of fevers Spencer places infection from preexisting lesions, such as ovarian

¹ Obstetrics, May, 1900.

² Brit. Med. Jour., Oct. 14, 1899.

and fibroid tumors, cancer, stone in the bladder or ureter, pyosalpinx, and appendicitis. Patients giving a suspicious history should be thoroughly examined during pregnancy, and the complicating lesions removed if possible. These cases require operation of some sort in almost every instance. The fourth class of fevers is due to external infection, and is seen clinically in 3 forms. The first is acute septicemia, which terminates fatally within a few days. The second is lymphatic septicemia, the usual form beginning with a chill; this extends into the peritoneum. The third is pyemia or venous septicemia, characterized by a succession of chills and by the formation of abscesses. The placental site usually sloughs in these cases. Mild cases of puerperal septicemia or poisoning by the chemical products of micro-organisms are often seen, and usually result in recovery. As regards the treatment of these conditions, he urges the routine examination of every patient toward the end of pregnancy. In this way not only is the size of the pelvis ascertained, but also the presence or absence of complicating lesions. Vaginal examinations are made less frequently, and the chances of infection are much diminished. The third stage of labor must also be carefully conducted, and the womb should be left clean and empty. He draws attention to disinfection of the hands, for which he prefers mercuric chlorid, and urges the disinfection of the vulva in every case. When septic infection is present, the uterus should be examined as soon as possible. The interior should be thoroughly explored and all retained material at once removed. The operator should use rubber gloves, thus avoiding danger to himself and to other patients. Care should be taken that no violent effort be made to empty a septic uterus. Only that tissue should be removed which has become partly loosened by pathologic processes. The uterus should be washed out by means of a glass tube. When the peritoneum is involved, Spencer has waited until the fluid became localized, and then has opened the collection through the abdominal wall or Douglas' pouch. The uterus should be removed when it is the site of carcinoma or contains a fibroid which can not be enucleated. He strongly deprecates the use of antipyretics, but prescribes stimulants freely. He is not inclined to favor the use of antistreptococcic serum.

As regards the *local treatment of puerperal sepsis*, A. Lee¹ arrives at the following conclusions: (1) A rise of temperature over 101.4° F. during the puerperium, not obviously accounted for by other causes, should lead to a thorough examination of the genital passages. (2) If no sufficient explanation is found in the condition of the perineum or vagina, a uterine douche should be at once given, with due precautions. (3) If within 24 hours the temperature has fallen definitely, no further exploration is required, but the douche may be repeated if the temperature again rises. (4) If at the end of 24 hours the temperature is higher, and the pulse-rate has increased, the cavity of the uterus should be explored with the sterilized finger. (5) If the initial rise of temperature is great (103° F. or over), with or without a rigor, the uterus should be explored at once, without waiting 24 hours to observe the

¹ Med. Chron., Aug., 1899.

effect of a douche. This is more especially indicated if the uterus is bulky, showing delayed involution, since this points to putrefaction of retained products or to septic endometritis. (6) If clots or placenta are discovered, they should be removed by the placental curet, a douche given, and a gauze drain inserted for 24 hours. (7) In the great majority of cases it is wiser thoroughly to curet the uterus, with the object of removing the whole of the decidua and retained products. (8) There is no evidence that curettage, if done with every precaution, favors the spread of infection. In a large proportion of cases the infection is rapidly checked. (9) In very virulent infection early curetting, with the object of sterilizing the uterine cavity, affords the best chance of a successful result. (10) If curettage entirely fails, it must be repeated or not, according to the local condition present. The prognosis, however, in the absence of a definite localization of the infective process, is bad. (11) In some cases, if curettage fails, and there is no evidence of general peritonitis or of infection of the blood stream, vaginal hysterectomy, if performed in good time, may be successful. (12) Antistreptococcic serum should be given early and freely in cases of proved streptococcic infection. It is of little use in the advanced stages of the disease.

Antistreptococcic Serum.—[An editorial remarks that it now seems quite settled that Marmorek's serum, the antistreptococcic serum, is a failure. Before the Société Obstétricale de France, Macé reported in April (1900) adversely to its use, and stated that its employment was rapidly being abandoned. His views were indorsed by others present. The dissatisfaction of the Institute Pasteur was likewise mentioned, which in itself is the most deadly blow the remedy (?) has received. The report of the Committee of the American Gynecologic Society at its recent meeting was distinctly adverse. A large majority of cases of puerperal sepsis are of mixed infection, and it was scarcely to be expected that a serum whose potentiality was limited (in theory) to the destruction of but one germ, the streptococcus, would prove successful. Denise, of Tourain, allows for at least 15 varieties of bacteria in the production of puerperal sepsis. He has prepared a serum with which sufficiently good results have been obtained to lead to further experimentation. Because of the failure of Marmorek's serum, we need not fear that serum-therapy in this disease is unavailable. A successful serum will yet surely be discovered.]

L. A. Hering¹ believes that failure in the action of serum may be attributed to: (1) Old serums. (2) The wrong serum. Strictly, antistreptococcic serum can be efficient only against toxins produced by streptococci; it must be useless when we have a mixed infection to deal with. (3) Delay in inaugurating treatment with the serum and administering it in insufficient quantities. (4) Overstimulation of the patient. Polak and S. Marx² claim that of the antitoxics used, unguentum Credé has proved its superiority over the antistreptococcic serum.

Surgical Treatment of Puerperal Sepsis.—Goffe³ says the ques-

¹ N. Y. Med. Jour., April 7, 1900.

² Med. Rec., Dec. 9, 1899.

³ Med. News, Jan. 28, 1899.

tion or even the propriety of hysterectomy for puerperal sepsis has yet to be determined, as there is no affection in which it is more difficult to lay down general principles of action. Two definite forms of puerperal sepsis are recognized—sapremia and septicemia. The former is the result of the absorption of toxins or ptomains secreted by germs growing upon a putrefactive focus. These are the products of the less virulent forms of bacteria, and the progress of the disease depends largely upon the resisting powers of the patient. Such cases are characterized by a chill and a sharp rise of temperature early in their history and by offensive lochial discharge. They should be promptly curetted with antiseptic douches, free drainage of the lymph-vessels should be kept up by catharsis, and the patient should be stimulated and nourished well. If the symptoms then are not arrested, but there are signs of constant infection, indicated by continual rise of temperature, tenderness over the uterus, chills, and languor, the question of operative interference arises. If, on the other hand, the infection is that of the pure streptococcus, the curet has no place. It simply breaks down the resisting zone and opens the way for ready entrance of the bacteria, and in the more serious cases it can not do good at the time of recognition of the disease, as the invasion has already passed beyond its reach. The nature of the treatment must be such as to assist the resisting power of the uterus against the invasion of bacteria. Bunim, the German pathologist, found that under favorable conditions an inflammatory exudate is found around the seat of invasion, which, aided by the phagocytic action of the white corpuscles, prevents penetration of bacteria to adjacent tissues, and the process is thus limited to a circumscribed area. But in more severe infection, or with less resisting power of the tissues, the bacteria break down the protective zone, enter the lymphatics and veins, and toxins and micro-organisms are carried through the system. A case of puerperal sepsis at the Polyclinic is reported at length. Curettage was first performed, and afterward abdominal hysterectomy, the uterus and broad ligaments being removed *en masse*. The walls of the uterus were studded with collections of pus, and also the ovaries and tubes contained pus. On the thirty-sixth day after operation the patient died of exhaustion following septic pneumonia. The author questions whether the fatal result was due to the delay in the radical operation; and, if not, what measures, if any, might have been used to prevent the case reaching the condition where radical procedure was necessary.

Vineberg¹ recommends that in every case of puerperal sepsis a thorough search for the site of the original infection, whether it be a wound of the perineum, vagina, or cervix, should be made; and that if found, it should be treated by surgical measures, such as drainage, irrigation, and the removal of debris by scraping. If, by exclusion or otherwise, it is decided that the site is within the uterus, it should be subjected to a thorough curetting with the finger or, preferably, the sharp curet; and if then the temperature does not fall, intra-uterine irrigations should be employed. It is a good plan to use for this purpose two

¹ Am. Jour. Med. Sci., Feb., 1900.

large india-rubber catheters, which if left *in situ* and changed every 24 hours, act also as an efficient drain. Of cases of puerperal sepsis, 95 %, even of the more serious type, yield to this treatment, which fails, however, in the other 5 %. In this case, and if no pelvic exudation is present to account for the increase of the septic symptoms, the abdomen should be opened at once. The further course of action is decided by the conditions found, but in most cases total hysterectomy is necessary. [The chief arguments for this radical treatment are that the septic uterus is analogous to a gangrenous appendix, and that even if the organisms of sepsis have entered the blood, recovery is possible when their breeding-place is removed. The exact indications for the operation in any given case are difficult to determine, but it may be stated broadly that if, after curetting, drainage, and irrigation have been employed, the pulse rises above 130, and grows weak and small, hysterectomy should be performed.]

Coccygodynia.—[There are probably various morbid conditions that may account for the painful affection known as coccygodynia—a term, by the way, not wholly satisfactory, since the pain is not always referred to the coccyx itself, is not invariably aggravated by movements of that bone, and is not generally cured by its removal.] H. Rose¹ seems to have discovered a previously unrecorded and probably unnoticed cause of the affection, and at the same time the fact that this particular form of coccygodynia may be cured by so simple a procedure as massage executed from within the rectum. He has met a number of cases in which the pain was increased by pressure upon a tender point situated in the immediate neighborhood of the third or fourth anterior sacral foramen, generally the fourth. In slight cases only this point of tenderness is detected, but in those that are severe there is tumidity also involving a very definite area of small extent. This swelling he attributes to chronic edema. In his first case he happened to observe that continued pressure on the tender and swollen spot, associated with gentle friction in a circular direction, caused the puffiness to disappear and at once relieved the pain. It came back after a few hours, but, acting upon the hint he had obtained, he repeated the manoeuvre daily for a time, and then at longer intervals, until at last even the occurrence of menstruation did not bring back the pain. He has employed this treatment in a number of cases, and invariably with good results. He thinks his success can not have been due to suggestion, for he was careful in all his cases to eliminate that possibility. [The trouble in these cases described by Rose seems to have been coccygeal neuralgia depending on pressure exerted by an edematous swelling on a sacral nerve at its point of emergence. Its manifestation in the area of distribution of the coccygeal nerve Rose attributes to the almost invariable communication of that nerve with the last sacral. This form of coccygodynia is favored by any condition that conduces to blood stasis within the pelvis, and after it has been cured by means of massage, relapses are chiefly to be guarded against by keeping the bowels free. Of course, inflammatory and con-

¹ Centralbl. f. Gynäk., Nov. 25, 1899.

gestive pelvic diseases favor the edema to which the neuralgia is attributable, and they should not be neglected; but Rose has made it plain that independent treatment of the coccygodynia is capable of curing it while yet such diseases persist. The author does not affirm that massage is the only remedy, but, as he is quite justified in remarking, it is a valuable addition to our resources for the relief of a very painful condition.]

Puerperal Insanity.—Wm. Hirsch¹ brings out some important points in regard to the relation of child-bearing to mental diseases. The author says that a specific form of mental disease which might be called puerperal insanity does not exist. The different psychoses which are observed during one of the stages of gestation are the same as those we see in other patients. Pregnancy may, under certain conditions, be one of the etiologic stages of insanity. Its etiologic importance, however, is proved neither by statistics nor by clinical observations. It is, therefore, not permissible to terminate pregnancy on account of the psychoses unless there are specific indications for such intervention. During parturition we sometimes meet a transitory disturbance of consciousness, the clinical features of which represent psychic epilepsy. Psychoses which occur in connection with the active parturition are produced: (a) by trauma in cases of difficult labor; (b) by anemia and exhaustion after severe hemorrhage; (c) by intoxication or uremia. The principal symptom of this group of psychoses consists of an acute delirium, which either leads to recovery after a short time or passes into a secondary psychosis. All these cases may be produced by the same causes in the nonpregnant state. The clinical features have nothing specific in this way. Lactation, as such, plays no rôle in the production of insanity. It is owing to other circumstances that during the first few months after delivery women on the average are more predisposed to nervous and mental diseases than under the ordinary conditions.

Lactation among the Poor.—Blacker² gives statistics of 1000 patients from the maternity department of University College Hospital, drawn up with a view to ascertaining what proportion of women among the poor in London are able to suckle their children. For the purposes of the inquiry a patient was considered to have suckled her child only when she had fed it by the breast for 7 months or longer. He found that of the 1000 women, 39 had never suckled, while 961 had suckled some or all their children. Of the 961 women, 747 had suckled all their children, while 214 had suckled only some. These 214 women had borne 1572 children, of which 986 had been suckled, while 586 had been fed artificially. The 39 women who had never suckled included 20 multiparæ, with 99 children, and 19 primiparæ. The reason given for nonsuckling was in 24 cases a total absence of milk. Of these 24 cases, 13 were primiparæ and 11 were multiparæ. The author points out that it may be justly inferred that the 13 primiparæ may be able to suckle their future children. He proceeds to analyze the 266 reasons given by the 214 mothers as to why they were unable to suckle some of their children. In 44 instances they were not allowed to or did not want

¹ Med. Rec., Jan. 6, 1900.

² Med. Chron., Feb., 1900.

to ; in 31 the children were unable to suck or refused to take the breast ; in 14 the mother had to go to work ; in 85 the milk went away after a variable time ; in 92 the milk was insufficient from the commencement. Blacker concludes that the fact that, out of the total 1000 women, only 11 multiparæ were unable to suckle any of their children owing to their having no milk, tends to confirm the view that among the London poor it is quite the exception for a woman to be prevented from suckling by an insufficiency of milk.

PHYSIOLOGY AND PATHOLOGY OF THE NEW-BORN.

Asphyxia Neonatorum.—[Among the various methods of resuscitating the apparently dead, the one suggested by Laborde has only recently begun to occupy the place to which its value entitles it. It is perhaps best known as a means of reviving patients who stop breathing under chloroform ; its application to the resuscitation of the drowned and of the hanged (by suicide) widened the area of its recognition, but no doubt its most frequent use in the hands of practitioners will be found to be in connection with asphyxia neonatorum. The pallid or greater degree of asphyxia in the new-born is often a cause of great anxiety to the obstetrician, and, when Hall's or Sylvester's artificial respiration, Schultze's swinging, Prochownik's feet-suspension, and other expedients have failed, a plan that promises success will be welcomed. Its value does not, however, simply consist in its being a last resource.] Fronczak¹ reports 4 successful cases of employment of the **Laborde method** of resuscitation, and points out several advantages which it possesses, even at the outset, over older methods. Of these advantages, two stand out prominently : In the first place, the child is kept in a warm bath all the time, and is thus saved the sometimes disastrous cooling of the body-surface which may follow swinging and other manipulations ; and, in the second place, there is no physical tax on the medical attendant's endurance, and this is really an important consideration, in view of the fact that half an hour or an hour may be spent in the efforts at resuscitation. Rapin² had for some time thought of trying the **introduction of air into the womb** to obviate asphyxia of the child during labor. He was urged thereto by an experience in which a difficult breech delivery terminated in fatal asphyxia for the child. He put his ideas into practice in 3 cases, which he reports. In all 3 the labor was very difficult, on account of disproportion between the pelvis and the fetal head, and want of development or immaturity of the infants added an unfavorable element ; one lived 10 days, a second 24 hours, while the third, of the hemicephalic variety, survived only a few hours. He publishes his results in the hope of inducing others to try the plan, for, though final success did not reward him in any one of the three, he considers that the results, as far as they went, were encouraging. Thus, all the children (breech deliveries) were born alive, and so far from any inconvenience

¹ Buffalo Med. Jour., Jan., 1900.

² Rev. méd. de la Suisse rom., No. 11, 1899, p. 688.

appearing to arise, it was noticed that the children had not their respiratory passages obstructed by mucus or liquor amnii—an important fact in restoration in cases of partial asphyxia, because artificial respiration is rendered so much easier. As regards the mothers, the procedure employed affected neither the labor pains nor the expulsion of the child; nor did it act in any way unfavorably on the course of the subsequent puerperium. The plan adopted was as follows: A gum-elastic catheter was connected by means of from 2 to 3 feet of rubber tubing with a syringe holding about 200 cc. With aseptic precautions the catheter was introduced into the uterus, passing anteriorly to the fetus. The syringe was filled with air drawn through aseptic cotton-wool held in the hand. About from 500 cc. to 600 cc. of air may be injected. The two main objections that have been urged are the danger of sepsis and gaseous embolism by entrance of air into the uterine veins. The first may be prevented by ordinary means. The second objection is lessened by the fact that the air is introduced into the amniotic cavity, and is, in consequence, not in direct contact with the uterine walls. The plan is indicated especially in cases of prolapse of the cord and in breech presentations when there is some obstruction to a normally rapid delivery.

The Collective Reports on Glycerinated Vaccine Lymph.—A. C. Barnes¹ for the past 10 months has been collecting reports on the value of glycerinated lymph. His inquiry was undertaken under three heads: (1) The value of glycerinated vaccine as a preventive of smallpox; (2) the proportion of successful "takes" in both primary and secondary vaccination; (3) the relative frequency of complications. The method of inquiry was by circular letter and by personal inquiry. In Baltimore, where for several months there had been a number of cases of smallpox, there were employed by the health authorities and physicians in private practice over 100,000 tubes of glycerinated vaccine. Those vaccinated were periodically observed until the success or failure of the vaccine was determined. In not a single instance did smallpox occur in persons vaccinated with glycerinated lymph. Conservative estimates place the number of successful "takes" as 95% in primary cases. The vesicles in most cases were typical and uncomplicated by suppurative infection. The number of exceedingly sore arms did not exceed 1%. In Minneapolis, in one series of 3145 vaccinations made with the glycerinated lymph, there were 29 failures, all being in persons who had been previously vaccinated. In the same city a second series of 8375 vaccinations resulted in 4 failures in secondary cases. In Cleveland both glycerinated vaccine and points were employed at the beginning. Results proved the superiority of the glycerinated lymph, after which points were almost entirely abandoned. The report gives a larger number of communications from individual physicians, giving the number vaccinated as running from 30 to 300. The successes and failures were about the same in all. The conclusion of the report is that the recommendation of the Marine Hospital Service that only glycerinated

¹ Am. Gyn. and Obst. Jour., Sept, 1899.

vaccine should be employed is substantiated by experiments. This vaccinating substance is free from pathogenic organisms. The measure of protection with glycerinated vaccine is much greater than when points are used. The complications, such as cellulitis and inflammation of the lymph-vessels, are rarely noticed after the use of the glycerinated product. The proportion of successful primary vaccinations when points are used does not exceed 60 %, while with the glycerinated vaccine from 95 % to 98 % is reached.

GYNECOLOGY.

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OF PHILADELPHIA.

PRELIMINARY AND GENERAL CONSIDERATIONS.

The Antenatal Factor in Gynecology.—[It must be conceded that in a very marked percentage of gynecologic cases some error of development is at the foundation of all the trouble. The developmental defect corrected, if this be possible, the symptoms will in large part be removed.] J. W. Ballantyne¹ and B. Robinson² have contributed interesting articles on this subject. Ballantyne affirms that it is now generally recognized that in the etiology of gynecologic affections there are 2 factors of paramount importance—the *traumatic* and the *infective* or *toxic*; but there is also a third factor, the *antenatal*, to which perhaps too little heed has been given. No gynecologist can be long in active practice without perceiving that traumatism, microbic and parasitic infections, and toxic influences do not serve to explain all the morbid conditions and all the phenomena connected with them. By the antenatal factor Ballantyne means more than the existence of gross malformations of the uterus and its adnexa, with their effects upon the performance of the functions of reproductive life. He also means all those abnormalities in structure, predispositions toward certain diseased processes, and inherited functional peculiarities which there is good reason to believe are determined antenatally, and which have often so powerful an effect upon the progress of gynecologic cases. The occurrence of such anomalies as atresia of the vagina, double uterus, and defective formation of the ovaries is well known to every gynecologist; every one is able to forecast with a fair degree of accuracy what the probable result of this or that malformation will be. But there are other and more subtle ways in which conditions and tendencies produced before the birth of the individual project themselves into her later life; these are not so generally known, at least their far-reaching effects are not so fully appreciated. It may at once be admitted that it is not possible to arrange all the morbid states which affect the female generative organs under one or other of these 3 factors; an etiologic classification of gynecologic complaints is not so simple a matter. It is not practicable, for instance, to group together all the diseases of the uterus that are due to infection, and then all those that are due to traumatism,

¹ Am. Med. Quarterly, Jan., 1900.

² N. Y. Med. Jour., Feb. 3, 1900.

and then all those due to antenatal states in a linear series. It would be coming much nearer the truth if the 3 factors were represented by 3 circles, 2 of which (the traumatic and the infective) bisected each other, while the third (the antenatal) touched the circumferences of the first and second. The antenatal factor is very evident in the morbid anatomy of gynecology. All the major malformations of the female generative organs and nearly all the minor ones are truly antenatal in origin. Trifling exceptions are found in the uterus pubescens, in atresia vulvæ superficialis arising from adhesive vulvitis in infants, and in some hypertrophic conditions of the labia and clitoris. The various types of double uterus (didelphic, bicornate, septate), the uterus unicornis, the uterus rudimentarius, the uterus fœtalis, the minor uterine malformations (incudiformis, parvicollis, etc.), and absence of the uterus; absence and atresia of the vagina, double vagina, unilateral vagina, and stenosis vaginæ; vulvar and hymeneal anomalies; absence and rudimentary development of the ovaries, accessory ovaries, accessory tubal ostia and diverticula, and rudimentary tubes; and the various forms of pseudo-hermaphroditism—these are some of the admittedly antenatal morbid states of the female genitals. All these anomalies are arrestments of normal embryologic processes; they are the expression of the pathology of the genital organs during the stage of their evolution or construction; they represent morbid embryogenesis; and, judging from what is known of the causation of malformations of other parts of the body in the human subject and among animals, it may be presumed that the disturbance of embryogenesis is brought about by the action of traumatism, microbes, or toxins upon the embryo *in utero*. But antenatal diseases, as well as antenatal malformations of the female generative organs, are met with and leave their impress upon the later history of the individual in whom they occur. Fetal pelvic peritonitis may be instrumental in producing congenital or pathologic retroflexion or ante-flexion of the uterus, with or without concomitant shortness of the vagina and conic cervix with pinhole os; the far-reaching effects of these morbid conditions are well known to every gynecologist. Even prolapsus uteri, with or without hypertrophic elongation of the cervix, has been found so soon after birth as to prove that it existed potentially before birth. Even the tumors which affect the female organs of generation may in some instances have an origin in antenatal life. This is especially true of the dermoid cysts or teratomas of the ovary. These growths are generally met in early reproductive life, even in some cases in childhood. Recent researches have revealed the existence of a long series of types of dermoid cysts, showing all the gradations from a growth containing only some hairs and skin, to one containing a rudimentary but perfectly recognizable embryo. Their origin may be explained by regarding them as the result of fetal inclusion or enclavement or of parthenogenetic and imperfect segmentation of ova in Graafian follicles; in any case the antenatal factor may be invoked. Further, many of the other neoplasms which render the operation of abdominal section so often necessary in modern gynecologic practice must be

ascribed to the cystic degeneration of structures which existed in antenatal life and ought to have atrophied completely. Robinson gives an interesting study of the development of the female genitals and their life-history.

Gynecologic Treatment of the Insane.—[The balance of opinion is still against the performance of gynecologic operations to remove nervous and mental symptoms; if performed at all, they should be directed against the removal of gross lesions.] A. T. Hobbs¹ discusses the advisability of surgical work among the insane. At the asylum for the insane in London, Ontario, there have been examined 187 selected cases with reference to the existence of disease of the pelvic organs. In these 163 distinct lesions were found, and in 155 surgical treatment was employed. There were 24 hysterectomies performed, among which were 3 deaths—one from exhaustion on the third day, a second from accidental hemorrhage, and a third from septic pneumonia. The ovarian operations included tubal disease, dermoid cysts, and hematoma; the ovaries were removed in 21 cases. In 2 cases of tuberculous peritonitis the abdomen was opened and flushed with warm salt solution. There were 42 Alexander operations and ventrosuspensions. Injured and diseased uterine cervixes received treatment in 48 cases, and 31 cases of chronic endometritis, metritis, and subinvolution were attended to. Lesions of the vagina and perineum, including fistulae, were repaired in 22 cases. Mental recovery followed the physical restoration to health in 38.5%, there was early improvement in 26%, and death in 2.5%. Of the 100 women reported recovered or improved mentally, 49 had been insane 2 years or over prior to the surgical treatment. Picqué and Febré² report a series of successful cases in which operations were followed by either a cure or marked improvement in the mental condition. In no instance was a healthy organ removed, the indications for interference being the same as in sane patients. In selecting cases great care was exercised to exclude those in which, from the hysteric tendency of the subject, there was reason to apprehend postoperative psychoses. The writers insist that judgment must be used in the selection of proper cases, since some patients will only be rendered worse by the operation. H. D. Tomlinson and M. E. Bassett³ from a study of this subject conclude as follows: Menstrual disorder and pelvic disease, while quite common among insane women, in the majority of cases bear no apparent relation to the insanity; nor is the intensity of the mental disturbance in proportion to the gravity of the physical disease. In cases in which the insanity has existed for more than a year, or the patient has a defective nervous organization, treatment of the disease of the generative organs is practically without effect on the insanity, and in such cases operative interference resulting in the establishment of an artificial menopause almost invariably hastens the onset of the dementia. Operative interference is called for in the treatment of pelvic disease among the insane for the same reasons that would determine the necessity for

¹ Canad. Pract. and Rev., July, 1899.

² La Gynécologie, June 15, 1899.

³ Jour. Am. Med. Assoc., Sept. 30, 1899.

such treatment among the sane. In order to determine whether or not treatment of disease of the generative organs will have a curative effect on the insanity, it is important to know the family and personal history of the patient with regard to the presence or absence of evidence of unstable or defective nervous organization, the length of time the insanity and disease of the generative organs have existed, and to what extent the general health of the patient is affected by the pelvic disease independent of the insanity.

The Correlation between Sexual Function and Insanity and Crime.—Macnaughton-Jones¹ stated in his address before the British Gynecologic Society that he wished to inquire how far the process of menstruation affected a woman by originating in the various groups of her pelvic nerves morbid impulses which find their response in reflected neuroses in other organs and thus influence the coherence and stability of her nervous acts. Or, again, in what directions and to what extent the normal fulfilment of ovulation with menstruation developed for the time being erotic impulses, encouraged the state of neuroses generally, or so lowered the psychic and physical inhibitory control as to lead to a hyperexaltation of the entire nervous system, with increased susceptibility to slight irritations and a weakened will-control that permitted of distorted mental visions and erratic moral acts, vulgarly called crimes, that the woman was helpless to evade or subdue. To elucidate these points he proceeded to inquire whether there was evidence that menstruation, both normal and abnormal, did so influence the woman, and under what conditions it was most likely to do so; and, secondly, how far disease of the sexual organs in women was correlated with symptoms of alienation, from slight interferences with their mental equilibrium to more profound disturbances, such as melancholia, dementia, or mania. This, in turn, led to the consideration of how far removal of the diseased organs by operation was salutary or otherwise to the woman; and to what extent the operation in itself might, on the one hand, mitigate or, on the other hand, increase the mental trouble. After discussing these points from the physiologic, clinical, and statistical sides, he summed up his conclusions as follows: (1) That the correlation of insanity and disordered sexual functions arising out of affections of the generative organs is a factor to be taken into serious consideration in the treatment of the mentally afflicted. (2) That when there is ground for the suspicion that some physical condition of the uterus or adnexa exists which might produce or aggravate the mental affection, a careful examination, under an anesthetic if necessary, should be made. (3) That in the investigation of criminal acts committed by women, either during the menopause or while the menstrual function is either active or suppressed, due weight should be given to the influence exerted on the mind of the woman by its irregularity or abeyance; in doing this, her previous history and temperament should be considered. (4) That the special dangers of the climacteric period should be remembered and the symptoms indicative of threatening climacteric mania recollected. The principal of these are

¹ *Lancet*, Jan. 20, 1900.

moroseness and depression of spirits, attacks of hysteria, occasional hallucinations, delusions with regard to relatives, unjust dislike, unfounded apprehension of some grave crime committed or injury inflicted, and suicidal tendencies. (5) That in operations on the female generative organs there is a greater predisposition to mental disturbance than after other operative procedures. (6) That women who have been previously insane are predisposed to a relapse by the development of disease in their sexual organs, and especially to such recurrence of insanity after operation on these organs. Under all such conditions and in the face of these warnings the closest supervision and greatest care are required to anticipate the insane impulse and to prevent suicide or crime in the case of women who manifest symptoms that are due to a correlation between disorders of the sexual organs and mental instability.

Enteroptosis in Relation to Diseases of Women.—[The relation of enteroptosis (Glénard's disease) to diseases of women is at present receiving marked attention. There is much of interest to gynecologists, therefore, in a synopsis of a paper by W. F. Hamilton,¹ of Montreal.] He says that, notwithstanding the conflicting views concerning the classification of cases under this head, it may be accepted as safe teaching, at least for the present, that enteroptosis may exist without subjective symptoms. The enteroptosis of Glénard is usually, however, associated with the most pronounced subjective signs, chiefly of a neurasthenic type. In those cases in which a pendulous abdomen is present, the nervous features are less pronounced than in the subject with flattened abdomen. Typical enteroptosis may result from inflammatory processes in the abdomen. Any of the abdominal organs may be displaced in this disease. Most frequently, however, the colon and small intestines, the stomach, the right kidney, and the liver are found in altered relations. The condition is due to an atony of the nervous system, with a corresponding relaxation of the muscular structures of the body. Its predisposing causes are heredity, chronic disease, unhealthful methods of living, and the wearing of corsets. The disease is often to be looked upon as a constitutional ailment. The diagnosis of enteroptosis is comparatively easy. The epigastrium is hollow; the two lower quadrants of the abdomen, even with the patient in a reclining position, are often quite prominent. It is most important to determine the lesser curvature of the stomach and its relation to the greater curvature. When the lesser curvature can be demonstrated, some degree of displacement exists; the amount of displacement is to be measured by the relation of the lesser curvature to the umbilicus. Palpation usually reveals a movable kidney, and the liver, when displaced, is usually more prominent in the epigastrium, and may be easily rotated on its long axis. In the diagnosis of this affection Glénard laid special stress on a test which was applied by the examiner standing behind the patient, also in the erect position, and laying both hands over the lower zone of the abdomen. Firm but gentle pressure is made upward. In the great majority of cases this affords considerable relief from the distressing pain which is felt in the epigastrium, and which is one of the patient's chief complaints.

¹ Pacific Med. Jour., Mar., 1900.

Blood Examination in Gynecology.—W. R. Griess¹ states that the relations of a normal or an abnormal temperature to pus-tubes and the relations of a leukocytosis to pus-formation when a normal or abnormal temperature is present are equally interesting. Should a leukocyte count be made in a woman having an elevated temperature and acute symptoms, with pus-tubes, we find, as a rule, a leukocytosis of from 15,000 to 20,000 leukocytes in 1 cubic millimeter. As the temperature becomes normal and the general health improves, acute symptoms subsiding, the leukocyte count will diminish to from 10,000 to 15,000 in a cubic millimeter. A leukocytosis of 10,000 per cubic millimeter or more in a woman in pelvic pain, after all acute symptoms have subsided, is—eliminating diseased conditions of the blood (*per se*) or of other organs by careful physical examination and by a careful consideration of the clinical history—indicative of suppuration of some one of the pelvic organs. A leukocytosis in a woman with pelvic pain associated with fever of a septic or continuous type is of no great value in making a diagnosis of suppurative disease of the uterine appendages. A simple salpingitis (catarrhal), just as with a catarrhal appendicitis, will produce a marked leukocytosis, but after acute symptoms subside the leukocyte count will again become normal. In this condition a leukocyte count is of value, not as a means of determining the presence of suppuration, but as an aid in making a differential diagnosis. But should a leukocytosis continue after the acute symptoms have subsided, then the presence of suppuration is almost certain. It not infrequently happens that the laparotomy is done for the relief of pain from an adherent retrodeviation, and upon opening the abdomen the malposition is found, but then only the true cause is revealed, some small pus-tubes, probably thickened and bound down by adhesions, dragging the uterus from its normal position. It is necessary to remove these diseased appendages; but had a leukocyte count been made, it might have saved an error in diagnosis. The differential diagnosis between typhoid fever and pus-tubes in prostitutes, and in women in whom a history of some uterine infection exists, is at times extremely difficult, but the presence of the leukocytosis determines the latter and rules out the former. Too much stress can not be laid on the fact that all other conditions which might produce a leukocytosis must be considered—tuberculosis in many of its forms, abscess cavities in any other places, suppurative pyelitis, furunculosis. A leukocytosis in chronic Bright's disease is very common, and there are many infectious diseases in which its presence is associated with definite clinical manifestations. There are cases with suppuration in which no leukocytosis is present. Cases in which the general health and the state of nutrition is very low have no leukocytosis, as a rule. Cases of secondary anemia rarely show a leukocytosis. Colored women who have pus-tubes or pelvic abscesses seem to be especially subject to menorrhagia and metrorrhagia, and in such cases the red count is often reduced to one-half, and the leukocyte count to about one-half, of what we would expect. In these cases, knowing the relation

¹ Am. Jour. Obst., Aug. 18, 1899.

of the red and white count, we are not at a loss in making the diagnosis.

Gonorrhea in the Female.—A. B. Tucker,¹ in a paper read before the New York Obstetrical Society, says that an extended experience with patients in whom gonorrhea is seen early has convinced him that in the vast majority of cases it begins in the glands of Bartholin or other structures adjacent to the vestibule. The urethral involvement is usually secondary, as is that of the vaginal mucous membrane. His treatment of these cases is by local application only, and he has found it effectual. Thiol has given the best results. When Skene's ducts are involved, a filiform bougie of the smallest size is taken, covered with cotton, and dipped in thiol of full strength. This is passed into the mouth of the duct. The application is repeated every other day until no pus can be squeezed out of the gland. If other structures are involved, absorbent cotton is saturated with thiol and placed in contact with the parts, the whole being held in place by a bandage. J. G. Clark² states that gonorrhea in women is much more difficult to diagnose than in men, chiefly because a whitish, leukorrheal discharge may be considered more or less normal in women, whereas in healthy men there is no urethral discharge. The very fact that a man has such a discharge is very strong presumptive evidence in favor of its specific origin, whereas no significance may be attached to a leukorrheal discharge in women. The certain diagnosis in women depends very largely upon the demonstration of the gonococcus in the secretions. A profuse purulent urethral discharge is quite as diagnostic as it is in men; but when it is remembered that the acute urethritis is only fleeting in character, and that the disease may persist for months and years after all symptoms have subsided, it will be seen how little importance can be placed upon this sign. Its presence is of great diagnostic value, but to assume because of its absence that there is no gonorrhea would be a serious error. In securing pus for examination the greatest precaution must be observed to avoid contamination with other organisms. For bacteriologic examination the vaginal discharge is almost valueless, because of the frequent presence of various cocci. The secretions from concealed passages are the ones to be employed. The urethra should be exposed, cleansed, and the secretion removed with the platinum loop and placed on a cover-glass. A drop of pus may be obtained from Bartholin's duct. The cervix should always be examined, as secretions obtained directly from the cervical canal are the most reliable. Methylene-blue is the most practical and easily manipulated staining fluid. Repeated microscopic examinations are necessary. One case is mentioned in which 20 negative examinations were made on successive days before the gonococcus was found. It is generally accepted that 12% of all marriages are sterile. Clark attributes 8% of the 12% to gonorrhea. [Reliable evidence to this effect is absolutely wanting; it has been, and is yet, repeatedly asserted, but assertion is far from proof, and until proof is given the profession at large, such deduction can be looked

¹ Am. Gyn. and Obst. Jour., June, 1899.

² Am. Jour. Med. Sci., April, 1900.

upon only as nonscientific and as merely personal opinion.] The localization of the infection is the deciding feature in the prognosis. It is favorable in acute gonorrhea of the cervix and urethra. If the entire genital tract is infected, it is due to insufficient treatment, active exercise during menstruation, sexual excesses, or the repeated infection of the wife by a chronically diseased husband. According to Ravogli,¹ the most effective antigonorrheal remedies so far known are ichthyol and the silver preparations. Ichthyol has a beneficial action, especially in cases of acute gonorrhea. Feigl² has treated cases of gonorrheal cervical catarrh by the method introduced by Landau, which is founded on the mutual antagonism between certain micro-organisms; in this case between the yeast-fungus and gonococci. The author's results have not been so brilliant as those obtained by Landau [possibly because in all his cases the diagnosis of gonorrhea was confirmed by a microscopic examination of the secretion, while in Landau's the diagnosis was made clinically, the cessation of the discharge being no guarantee of the cure of the gonorrhea]. The treatment was carried out exactly as described by Landau, from 10 cc. to 20 cc. of ordinary fresh beer-yeast, mixed with a small quantity of beer, being injected every day or every few days into the vaginal fornix with a syringe. Before the injection the vagina is cleansed with a douche of hot water and dried with cotton-wool; and after it is given, is plugged with a tampon. The average number of injections given to each patient was 6. The greatest number in any one case was 21. Though a slight diminution in the number of times the gonococcus was found, when repeatedly looked for microscopically, was observed, the gonococcus did not finally disappear even in the cases treated the longest. In 23 cases, with scanty mucous or mucopurulent secretion, there was a clinical improvement, the discharge being more watery or altogether ceasing; but in more severe cases the treatment almost always failed, and had to be abandoned in favor of older methods. Some cases, especially when the injection was made only once every second or third day, became decidedly worse, with an exacerbation of the inflammatory symptoms. In one case the injections were followed by slight, in a second by severe, parametritis, but in all the others they were well borne. Feigl does not, therefore, consider the method to be any improvement on those previously in use, which consisted in rest and cleanliness for acute cases, in the application of some astringent on a Playfair's probe every few days, and in the introduction of vaginal tampons soaked in tannin-ichthyol glycerin twice a day.

AFFECTIONS OF THE VULVA, VAGINA, RECTUM, AND BREAST.

Kraurosis Vulvæ.—J. M. Baldy and H. L. Williams³ give a full account of this very rare and somewhat ill-defined disease. To Breisky belongs the honor of first bringing the subject before the profession,

¹ Med. News, Nov. 18, 1899.

² Wien. med. Woch., Nov. 4, and Nov. 11, 1899.

³ Am. Jour. Med. Sci., 1899, vol. CXVIII, p. 528.

with a full description in detail of 12 cases. Lawson Tait gave the name of "serpiginous vascular degeneration of the nymphæ" to the condition



Fig. 59.—Microphotograph of normal labium magnus, showing numerous hair follicles, sebaceous glands, and blood-vessels in the subepithelial tissue (Baldy and Williams, in *Am. Jour. Med. Sci.*, vol. CXVIII, 1899).



Fig. 60.—Microphotograph of labium, showing great hypertrophy of epidermis (see Figs. 59 and 63); blood-clot upon the surface, and entire absence of sebaceous glands and hair follicles in the corium (Baldy and Williams, in *Am. Jour. Med. Sci.*, vol. CXVIII, 1899).



Fig. 61.—Microphotograph of labium, showing enormous hypertrophy of stratum corneum and stratum Malpighi; epithelial pearls in the epidermis (Baldy and Williams, in *Am. Jour. Med. Sci.*, vol. CXVIII, 1899).

as early as 1877. The authors consider that the disease presents clinically many striking features. The first symptoms noticed are usually

those characteristic of pruritus, which consist of an intense and more or less progressive itching and burning of the vulva. In some cases the affected tissue is exceedingly hyperplastic, and dyspareunia develops early. The skin is frequently discolored and small red spots appear on

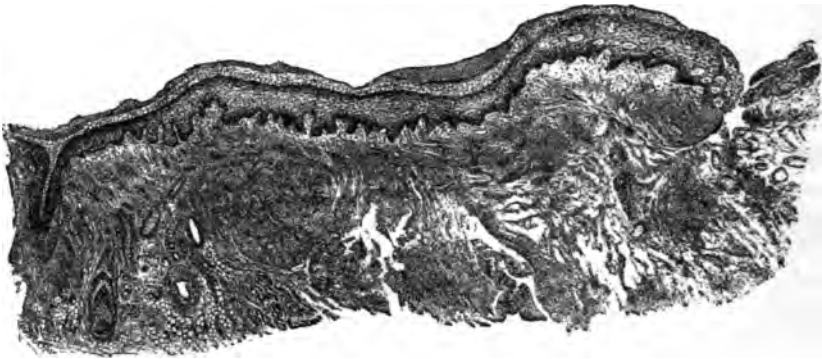


Fig. 62.—Showing hypertrophied epidermis, with blood-crust adherent to the surface; to the right, fissure extending well into the corium. Hyaline transformation of outer portion of the corium, with entire absence of hair follicles and sebaceous glands. In the deeper subepithelial tissue to the right, extensive areas of free red blood-corpuscles, with sclerosis of the elastic and muscular fibers; to the left, hair follicles, blood-vessels, and bundles of muscular fibers in cross-section, with areas of small round-cell infiltration (Baldy and Williams, *Am. Jour. Med. Sci.*, vol. CXVIII, 1899).

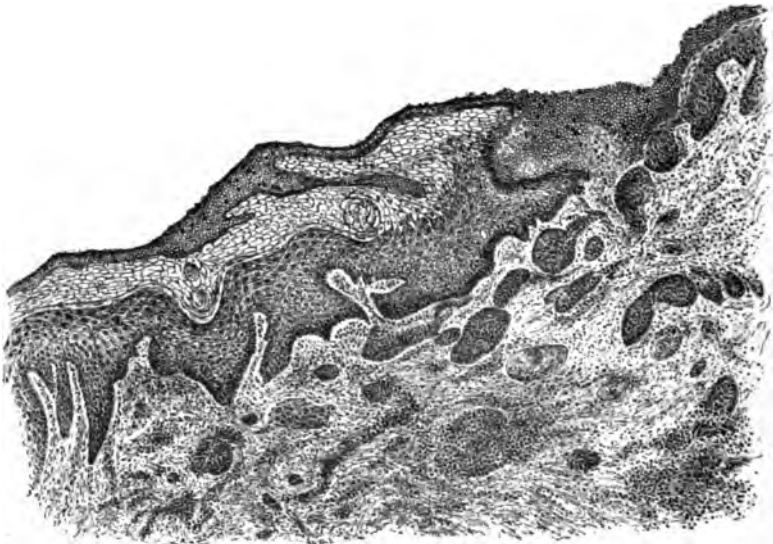
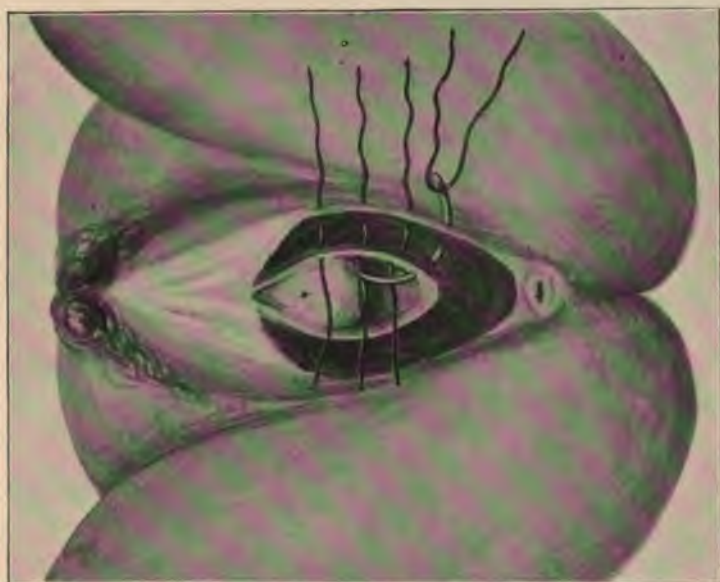


Fig. 63.—Showing hypertrophied epidermis, adherent blood-crust on the surface; fissure extending through epidermis into the corium; and extensive round-cell infiltration in the subepithelial tissue. Hair follicles and sebaceous glands entirely absent (Baldy and Williams, *Am. Jour. Med. Sci.*, vol. CXVIII, 1899).

the surface. Some time after these symptoms are noticed a peculiar shrinking of the superficial tissue of the vulva begins to take place. Discolored spots appear, which are hyperesthetic. The skin becomes dry and whitened, and often is covered with a rough and thick epidermis. The disease is rare, as is shown by Fleischman, who observed 8

PLATE 3.



Showing denuded area and approximation of healthy skin and mucous membrane (Baldy and Williams, in *Am. Jour. Med. Sci.*, vol. cxviii, 1899).



Kraurosis vulvae: Showing affected area, with contracted vaginal orifice (Baldy and Williams, in *Am. Jour. Med. Sci.*, vol. cxviii, 1899).

cases among 1550 patients. Lewin, at the Charité, found no instance of it among 70,000 patients. After enumerating the views of various authorities as to its pathology, the authors proceed to a description of the conditions found in their own case. Examining the epidermis in detail, they note that the stratum corneum, stratum lucidum, stratum granulosum, and stratum Malpighii can be differentiated with great distinctness in most of the thicker portions where hypertrophy is present, while in the parts where atrophy has taken place the layers are indistinctly blended together, the stratum lucidum can scarcely be discerned, and the stratum Malpighii fades away often to a mere thread. A blood-crust, like another layer, is seen on the free surface of the epidermis. Cracks or fissures in the epidermis are noticed which penetrate the corium and may be filled with blood-crusts, which are composed of red blood-corpuscles with a few leukocytes. The etiology of the disease is a matter of considerable doubt. Breisky, who saw 12 cases, could find no cause beyond the clinical fact that the patient suffered from a vaginal discharge and pruritus. Jenowsky, who has instanced 6 cases, thought that a long-continued discharge and syphilitic ulcers had had a definite bearing upon the etiology. Orthmann, who made both microscopic and bacteriologic examinations of 5 cases, failed to find anything definite, but considered gonorrhea and vaginal discharges as causative factors. Many cases occur after the age of 40, and hence the menopause may be a predisposing cause of some importance, but it must be noted that several of Breisky's cases occurred in pregnant women; glycosuria and albuminuria may or may not be present. The authors divide the treatment into palliative and curative. Carbolic acid and cocain appear to them to afford temporary relief. Lawson Tait recommended a solution of neutral acetate of lead in glycerin placed on cotton-wool between the nymphæ as a soothing remedy. The application of solid nitrate of silver, hot water, and curettage appear to produce only a temporary relief. Martin first suggested excision of the diseased tissues as a curative measure. The authors consider that if this is done, a favorable prognosis may be given. Full details of the case which came under their notice are given. The patient was aged 43, and had been married 19 years, with one child 14 years of age. She was quite well until 4 years before this illness began. Obstinate itching was the chief symptom. No specific history could be obtained, and specific infection was quite unlikely. Her suffering was due to gradually increasing difficulty in sexual intercourse, owing to a contraction of the parts. After repeated attempts to relieve her by dilation, excision of the diseased tissues was performed, with the subsequent wearing of a glass vaginal tube, 2 inches in diameter. A complete cure has so far resulted. The accompanying illustrations (Plate 3) show the diseased condition and the method of operating.

Classification, Origin, and Nomenclature of Incomplete Conditions within the Female Sexual Organs during Gestation.—[Of incomplete internal sexual organs, no less than 50 different species can be distinguished. The variability in this respect in the female is, there-

fore, far greater than in the male. But if, on the one hand, the several formation anomalies of the female canal are easily recognized from an anatomic standpoint, on the other hand, our knowledge concerning their causes is, as yet, obscure.] With the intention of clearing up this obscurity somewhat, F. von Winckel¹ has made elaborate investigations. He criticizes as incorrect the nomenclature given by Kussmaul, Nagel, and Gebhard, and very elaborately enters into the embryonic development stages, attaching significance to the malformation of the ligamentum rotundum, where it is inserted in the canal of Wolff. If the canals of Müller are primarily unequal, or if this is the case with the ligamenta rotunda (perhaps showing hyperplasia on one side or both sides), the uterus, or rather one-half of the uterus, is liable to be drawn toward its anterior portion, resulting in an acquired obliquitas uteri intra-uterina, etc. Von Winckel concludes by an analytic classification of all causes. (A) *Local causes*: (1) Irregularities in the formation of the abdominal wall (hernia umbilicalis congenita; fissura pelvis et vesicæ, etc.). Abnormally short amniotic filaments; absence of the placental artery, etc. (2) Inflammatory processes: fetal peritonitis; nephritis; oophoritis; pelviperitonitis. (3) Malposition caused by tumors—*e. g.*, cystic kidneys, etc. (4) Pulling, pressure, torsion, proceeding from neighboring organs: bladder, ureter, canal of Wolff, ligamentum teres, vessels and nerves of the uterus. (5) Abnormal germs in the septum. (6) Absence of vulva. (B) *General causes*: (7) Constitutional causes: anemia, chlorosis, lues, rachitis congenita, hyperplasia of the vascular system. (8) Central-nervous causes: hydrocephalus, encephalocoele, anencephalus, and other cerebral anomalies. Von Winckel is of the opinion that the causes mentioned under (4) are by far the most frequent. In the nomenclature of the formation anomalies of the female sexual organs von Winckel wants the designations uterus didelphys, uterus bipartitus, bifidus, bilocularis, bicameratus, uterus foetalis, uterus bicornis, uterus foetalis imperforatus, etc., omitted altogether, as all these expressions lead only to misunderstandings.

Tumors of the Vulva and Vagina.—Sand,² from a study of cancer of the vestibule, arrived at the conclusion that trauma is the starting-point of the disease. He believes that masturbation is one of the most frequent causes. Koppert³ reports 25 cases of primary cancer of the vulva from the Jena clinic. He finds that the disease begins most frequently in the labia majora and vestibule, epithelioma being the prevailing type. The condition of the inguinal glands is of vital importance. Those about the seat of the growth should be removed at the time of operation if they are enlarged. Pruritus is the most common symptom in the incipient stage. The prognosis is very unfavorable. Thorough excision of the growth and of the affected lymph-glands offers the only means of relief.

Pryor⁴ states that cancer of the vagina is very rare. It usually

¹ New Orl. M. and S. Jour., Mar. 9, 1900.

² Inaug. Diss., Centralbl. f. Gynäk., No. 27, 1899.

³ Centralbl. f. Gynäk., No. 27, 1899.

⁴ Med. Rec., May 5, 1900.

involves the posterior wall of the vagina and extends underneath the rectum ; then to the vaginal structures and to the uterus. He describes the operation which he employed in 2 cases, giving as the first step a primary and preventive hemostasis. By this not only the field of operation is rendered dry, but migration of the cancerous cells is prevented. He avoids all injury to the cancerous field until hemostasis is secured and the cancer has been charred by the cautery. He removes all the organs in which recurrence is apt to take place, and removes them from above downward. He establishes an artificial anus near the site of the normal outlet of the rectum. The cancer is prone to spread by invasion of the tissues having a common source of blood. This operation seeks removal of all organs belonging to the vascular group in which the affected organ is placed. Pryor details the history of the 2 cases operated upon. The form of operation in use formerly was that of Olshausen, which was a blunt dissection of the vagina from the rectum. This was rather a failure. The steps in Pryor's operation are : (1) The general preparation of the patient ; (2) the incision from the umbilicus to the pubes ; (3) the ligation of the vessels and ligaments ; (4) dissection of the bladder from the cervix and entrance to the vagina anteriorly ; (5) removal of the vagina and the entire rectum ; (6) ligation of the obturator artery to prevent anastomotic circulation being formed. The actual cautery is used for charring the cancerous mass. The vagina and rectum and the perirectal tissues are excised, and the formation of the artificial anus is established near its normal situation. The technic of the operation is illustrated by drawings, and the author emphasizes the fact of the rarity of this form of malignant disease ; he calls special attention to the method of removing the rectum as high up as the sigmoid flexure, as well as almost the entire vagina. Mundé considers it fortunate that these cases are rare. He has seen only 2 cases of primary cancer of the vagina in a long experience. He has curetted and cauterized. He does not consider that such bloody and radical work pays for the slight benefit received by the patient, as recurrence is inevitable. Sutton has seen but one case in 34 years, and has little faith in such radical operations. The pathology of cancer should engage our attention. Instead of a new method, we need to find the factor producing cancer. F. van de Warker feels that nothing has been gained by operation for cancer. Montgomery says that the great frequency of recurrence of malignant disease, when it involves the vagina and extends into the parametrial tissue, and when it invades the broad ligament, leads him to believe questionable the operative treatment of these cases. It has been said that there is no plan of treatment by which a patient can be insured against relapse, and, unfortunately, we are unable, even in the early development of the disease, to say that it has not already been carried into the parametrial tissue and beyond. He has frequently seen patients in whom he felt that an operative procedure would result favorably, and in whom there was early return of the disease. He has seen other cases in which there was extensive destruction of the cervix and in which the question of the wisdom of an operation

was a grave one, and yet in these patients several years have elapsed without recurrence. [We are at present in a position of simple uncertainty; we could say in individual cases whether operation would afford a favorable opportunity for the recovery of the patient.]

Nonmalignant Rectal Stricture in Women.—R. Peterson¹ states that acquired rectal strictures are much more common in women than in men. Gosselin and Dubar estimate the proportion as 4 women to 1 man. Of the cases of rectal strictures collected by Juliusburger, there were 103 women and 15 men, or about 7 of the former to 1 of the latter. Out of 110 cases treated by Allingham in St. Mark's Hospital, there were 92 females to 18 males, or in the proportion of 5 to 1. The ratio is even greater in Cripp's series of 70 cases, as out of this number there were only 7 males, or in the proportion of 9 to 1. Carré's statistics in 266 collected cases show 4 women to 1 man afflicted with the disease. The same ratio was found by Gant in 25 cases, while the proportion in the 21 cases recorded by Quénu and Hartmann, in their recent work on the rectum, is considerably less, since there were only twice as many women as men. The only exception seems to be Kelsey, who in a series of 99 nonmalignant strictures found 64 in males and 35 in females, or nearly twice as many males as females. However, the preponderance of evidence is in favor of the relative frequency of the condition in women. For the purpose of etiologic study, strictures of the rectum are conveniently divided into: (1) Those in which the caliber of the tube is diminished by pressure from without, organic changes in the rectal wall being secondary; (2) those in which the rectal walls are primarily affected, narrowing of the rectum resulting from these organic changes. The first class is usually caused by suppurative disease of the appendages. Strictures resulting from organic changes primarily affecting the rectal walls may follow trauma, dysentery, gonorrhea, tuberculosis, and syphilis.

Cancer of the Breast.—The Lettsomian Lectures on cancer of the breast were delivered by Sir W. M. Banks.² He stated that there was an undoubted increase of cancerous disease. According to Park, the death-rate in England and Wales from cancer has risen from 1 out of 5646 of population in 1840 to 1 out of every 1306 of population in 1890—that is to say, in 50 years the death-rate has increased between 4 and 5 times. Well-nourished, well-developed, healthy persons are most numerous among the victims of cancer; that is, the increase of cancer is synchronous with an increase of nutrient material. During the last 30 years the comparative cancer mortality of the sexes has altered in a most singular manner, so that whereas the disease was formerly more prevalent among females, it has now become more prevalent among males. Confirmed drunkards are not more liable to it than other people, nor has Banks been able to trace any connection between syphilis and cancer. The main cause of the increase in frequency is richer and more abundant food. It is the male who eats the heavy food in ever-increasing quantities, while the female remains much as before in her

¹ Jour. Am. Med. Assoc., Feb. 3, 1900.

² Lancet, Mar. 10, Mar. 24, April 7, 1900.

eating. Early diagnosis of the disease is of paramount importance. It is true that in the very early stages of a mammary cancer a certain and positive diagnosis can not be made, even by the most skilled and experienced surgeon. A lump in the breast should always be regarded with suspicion. Unfortunately, there are no neoplasms which produce less pain in their early stages than cancer. The absence of cachexia must not be regarded as a hopeful sign, since cancer is most common in the ruddy and well nourished. Retraction of the nipple will not occur unless the disease is situated just beneath that organ. Adhesion of the skin does not occur with any other tumor than cancer except in inflammatory swelling of the nature of an abscess. But there is a different appearance between the skin in the two cases. In the inflammatory adhesion the skin is fairly smooth over the abscess, or whatever of an inflammatory nature underlies it. But over a carcinoma, if you try to pinch the skin up between the finger and thumb, immediately a number of fine points appear, which are the hair follicles caught and tucked down by the cancer. It is exactly like the leather of a saddle, inso-much that Banks has always demonstrated it to students under the name of "pigskin." This "pigskin" appearance is almost certainly indicative of subjacent carcinoma. A breast should never be removed, however, without first cutting into the tumor as soon as the patient is anesthetized, or a small exploring trocar and cannula should be used, in order to exclude a chronic mastitis, a small fibro-adenoma, or a small but very tight simple cyst. Banks always examines a breast tumor in three positions. In examining, say, the left breast in the first position, the surgeon should stand behind the patient, with his left arm passed beneath her left armpit and his right arm over her right shoulder. The surgeon should be steady on his feet, and the patient should be asked to press back against him. He can thus regulate the pressure he is putting on with his hands to a nicety, and make the best possible use of his sense of touch. When the breast is examined from the front, the surgeon puts a certain amount of pressure on it, and the patient yields from it, and so the judgment of weight, so essential to determine the nature of a soft body, is lost. In the second position the patient should be firmly seated in a chair, and the surgeon should examine the breast from the front. In the third position the patient should be on her back on a sofa. Now, in each of these positions the surgeon will acquire a new appreciation of the tumor; but the first is by far the most effective, for in it he will avoid the mistake—so liable to be made in the other two, especially the third—of crumbling up a mass of sound tissue, so that it comes to feel just like a tumor. All things under the chin, down the neck, in the breast, and in the groin should be examined by the surgeon, standing behind the patient. In discussing the **parasitic nature** of cancer of the breast Banks concludes as follows: (1) There is plainly a structure of a definite nature, which is found in man at the marginal or growing edges of carcinomas. It is not found in any healthy tissue or in any other neoplasm except sarcoma. It used to be regarded as a protozoon or coccidium, but most investigators seem now to regard it (as

Russell did at first) as a blastomyces, which is a form of saccharomyces, reckoned to be a development stage of certain fungi. Most parasites are inside the epithelial cancer cells, but some are outside. There is a strong probability that they spread by sporing, although much more knowledge on this point is wanted. How they get into or originate in the human body is not known, and what action, if any, they have upon the epithelial cells has not yet been demonstrated. But, admitting an action, it is doubtless that of an irritant to them, which causes them to proliferate. (2) There is no doubt that from these parasites cultivations in certain media can be made; and that when such are injected into animals, growths are produced in them, mostly of a fatal character, which contain these parasites. (3) Sanfelice asserts that he can produce the same results in animals by the injection of a blastomyces obtained from a fruit-juice; furthermore, that by passing the parasites through a series of animals a tumor is at length produced which is an adenocarcinoma. On these points Banks can not say anything of his own knowledge. (4) That as yet there is no clear and indisputable proof of the infectivity of cancer; that consequently any strong assertions to that effect, or any statements that surgeons infect wounds by disseminating cancer products through them during operations, are not justified; that, on the other hand, the possibility of this infectivity must not be sneered at or treated lightly, in view of the remarkable information which has been obtained during the last few years concerning the cancer parasite and certain of its attributes.

PERINEORRHAPHY.

A Plastic Operation Designed to Substitute the Levator Ani and the Gluteal Muscles for the Lost Sphincter Ani.—Lennander¹ had brought to him a patient suffering from incontinence of the feces, as a sequel of a severe phlegmonous process which had entirely destroyed the anal sphincter. For the purpose of remedying this disability the following operation was performed: A cut was made in the middle line, traversing the under half of the sacrum and the coccyx. From the point of this bone it was carried to each side in a curve the convexity of which touched the tubera ischii. The two gluteal muscles were freed from the sacrum and from the sacro-ischiac ligaments. To a point corresponding to the upper half of this ligament these muscular flaps were still further freed by a $1\frac{1}{2}$ -inch incision running from the sacrum in the direction of the muscular fibers. The scar tissue, which was placed above the posterior portion of the rectum, was, together with the raphe of the anal perineum, dissected from the point of the coccyx. The levator ani and the coccygeal muscle were then exposed and were divided by a transverse cut reaching almost completely across the pelvis, yet so planned that the arcus tendineus of the levators was not too nearly approached, thus avoiding injury to the nerves which supply these muscles. The levator ani could not be separated from the coccygeus

¹ Centralbl. f. Chir., No. 25, 1899.

without dividing the inner layer of the pelvic fascia. The levators were drawn down and forward against the rectum, and were secured in this position by 4 catgut sutures placed in the middle line. The defect in the pelvic diaphragm resulting from this transposition was then closed by drawing the two gluteal muscles, which had previously been dissected loose, forward as far as the anus, and fastening them in this position by heavy catgut sutures; uniting them first each to the other, then to the levator ani, and finally to the periosteum of the coccyx. Two drainage-tubes were inserted under the gluteal muscles. The anal aperture was kept closed by sutures during the operation. The wound suppurred freely. In spite of this, the ultimate result was an extremely good one.



Fig. 64.



Fig. 65.

Operation for the repair of complete tear of the rectovaginal septum (Kelly, in *Med. News*, Sept. 9, 1899).

The muscles were regularly exercised by means of the galvanic current and by voluntary efforts on the part of the patient to retain enemas. The author believes that this method of operating may be serviceable in relieving the incontinence which frequently follows cancer operations.

H. A. Kelly¹ describes a method of treating complete tear of the rectovaginal septum by turning down an apron into the rectum and by buried sutures through the sphincter muscle. (Figs. 64, 65, and 66.) This method originated with J. C. Warren, of Baltimore. Kelly modifies Warren's method in two ways: First, the combination of a flap turned down into the rectum with the buried suture to the dissected

¹ *Med. News*, Sept. 9, 1899.

sphincter; and, second, the use of figure-of-8 sutures buried in the septum to do away with the dead central space. The method for performing the operation is as follows: The area to be denuded is outlined by making the basal incision across the septum on the vaginal side in advance of the sphincter end, and at least 1 cm. in advance of the margin of the rectal mucosa. The denudation then extends up into both vaginal sulci in the usual manner. The important point in which the operation differs from the ordinary Emmet procedure, generally employed, lies in the treatment of the undenuded portion between the basal line and the rectum. Instead of cutting this off in strips, it is dissected loose from above downward and turned down toward the rectum like an apron.

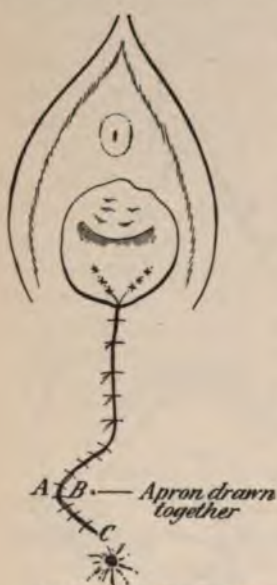


Fig. 66.—Operation for the repair of complete tear of the recto-vaginal septum (Kelly, in *Med. News*, Sept. 9, 1899).

The purpose of this fold or apron is to protect the broad wounded surface in the septum from any contamination on the side of the bowel, which it does in the following manner: As soon as the stitches are passed which bring the septum together from side to side, the apron of tissue is also folded loosely together and turned down toward, and sometimes projecting entirely from, the anal orifice. This at once protects the septum from infection, as every movement of the bowels only tends to push this curtain down and out, and no longer tends to force fecal matter up between the stitches. This natural tendency of the apron to protect the septum is reinforced by a series of delicate sutures uniting the edges. After making a separate dissection of the sphincter ends, the suturing is begun by drawing together the internal sphincter, which is well exposed, by a series of figure-of-8 sutures extending well up into the septum and obliterating entirely the dangerous dead central space. Three or 4 of these sutures take the place of 3 times the number of interrupted sutures

formerly applied on the side of the rectum. The sphincter ends are then united by 3 interrupted catgut sutures. The sulcal sutures are next applied, and then those on the perineal surface. Finally, the edges of the apron seen projecting from the anal orifice are united by very fine silk or catgut sutures.

CONDITIONS OF THE CERVIX UTERI.

Influence of Plastic Operations upon the Cervix on the Reproductive Functions.—Doléris¹ considers this subject from the threefold point of view of conception, pregnancy, and delivery. With regard to conception, Doléris' cases have been made the subject of theses by Du-

¹ *La Gynécologie*, April 15, 1900.

casse, Isaac, Lefevre, and Bernheim. He is still able to express his opinions with regard to the relations of trachelorrhaphy and conception as follows: Emmet's operation reestablishes the conic cervix, which is itself a bad conformation for conception, and from the point of view of parturition it makes a cervix like that of the elderly primipara by preserving tissues which are firm, and which resist dilation. With regard to Schroeder's operation, it is not fair to state that it tends to prevent conception. We have occasionally the occurrence of sterility following this form of intervention, perhaps after one or two pregnancies have intervened. But since this state of affairs might occur after other events, without any possible association whatever, it is hardly fair to lay the blame upon a single operation. With regard to Schroeder's operation causing abortion, or premature labor, Doléris claims that in the great majority of these cases the labor has gone on to term. The cervix can be dilated after a Schroeder operation with as much ease and rapidity as the average normal uterus. It is true that Pinard reported a fatal case of rupture of the uterus in a patient who had been operated upon à la Schroeder. The same author also collected notes of 16 cases, with 11 unfortunate endings to labor, under the same circumstances: viz., 5 abortions and 6 premature labors. Doléris analyzes these cases, and thinks he is able to show other causes for the interruption of pregnancy, so that in but 2 of the 11 are we justified in ascribing the accidents to the fact of the previous operation. [Similar attempts are made to discredit the work of cases cited by Champetier de Ribes, Porak, Lepage, and Audebert, authors who have written against the Schroeder operation.] Doléris states as a general axiom that when an abortion follows a Schroeder operation, the conditions which originally led to the operation may themselves have led to the abortion. Very much depends upon the technic employed. A tendency to abortion might result from a badly performed operation. The author insists upon 5 requisite elements: viz., previous antisepsis, complete abrasion of all the sclerous tissue, exact apposition, sutures (catgut) which will become reabsorbed, and permanent postoperative asepsis. Cases are given in which neglect to exercise care in each of these steps led to serious results.

FISTULÆ.

Operation for Vesico-uterine Fistula.—Dranitzine¹ speaks highly of an operation which consists in detaching the bladder from the uterus, and closing the vesical and uterine openings separately, after which the wound in the anterior vaginal fornix is sutured. The advantages claimed for it are as follows: The entire field of operation is brought into view without the necessity of incising the cervix and everting its lips, as practised by Joubert; uretero-uterine fistulæ may be repaired in the same way, and an accompanying vesicovaginal fistula may be closed at the same sitting; in all the reported cases the cure has been perfect and permanent, and no complications have occurred during or after

¹ Jour. russe. de Gynéc. et d'Obstét., No. 9, 1899.

operation. Vitrac¹ in the treatment of vesicovaginal fistula suggests a continued ventral position, in the hope of obtaining a cure by this method without operation. He would place the patient in this position in the case of a simple recent fistula, and would introduce a catheter. If an operation was required, he would insist upon the ventral position after operation. If the bladder was noncontractile after suture of the fistula, it would be possible in this position to make pressure upon the posterior bladder-wall.

THE URINARY ORGANS.

Mensuration and Capacity of the Bladder in Women.—G. L. Hunter and P. Lyon² report the result of a series of investigations

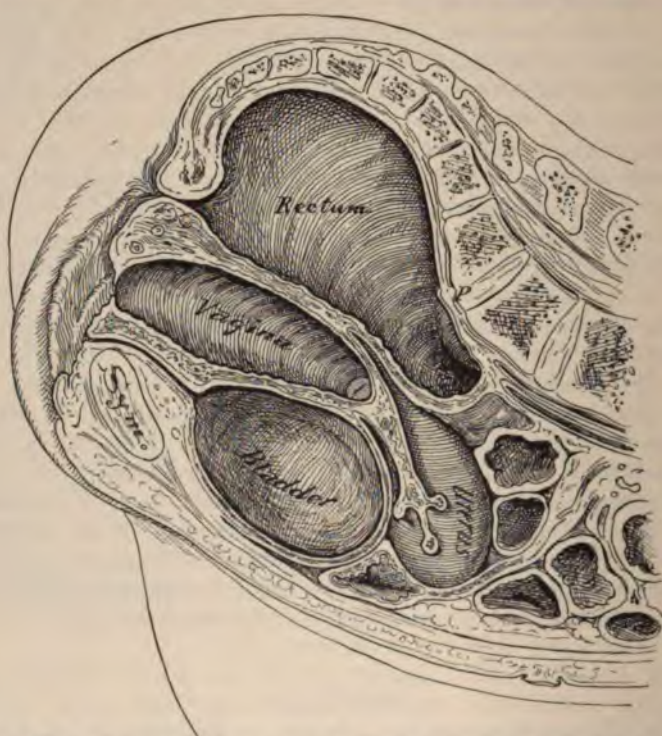


Fig. 67.—Median section, knee-breast posture, showing the anatomic relations of the pelvic organs when the rectum, vagina, and bladder are dilated by atmospheric pressure (Hunter and Lyon, in Jour. Am. Med. Assoc., Dec. 16, 1899).

made at the suggestion and with the assistance of Kelly to determine the measurements and capacity of the bladder in women. (Figs. 67, 68, and 69.) All experiments were made on healthy living women in the knee-breast posture, the rectum, vagina, and bladder being dilated by atmospheric pressure produced by opening these cavities to the outside air by the insertion of a speculum, after Kelly's method. In the

¹ Gaz. hebdom. de méd. et de chir., Dec. 14, 1899.

² Jour. Am. Med. Assoc., Dec. 16, 1899.

25 women examined the average bladder capacity by atmospheric distention was found to be 303 cc., individual cases ranging from a mini-

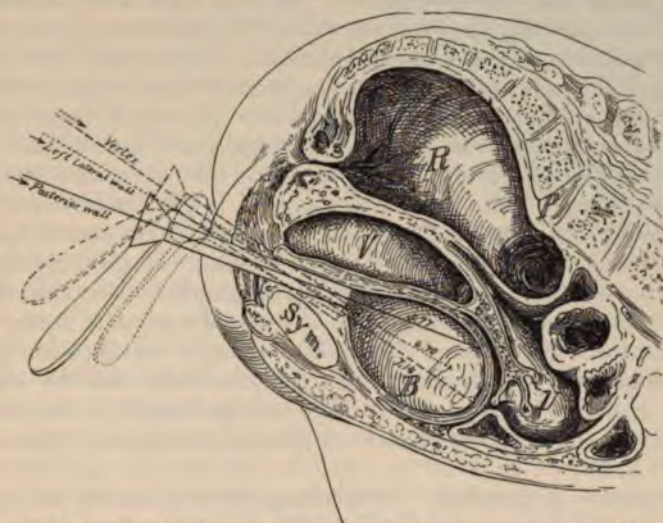


Fig. 68.—Median section, knee-breast posture, showing the pelvic cavities dilated by atmospheric pressure, and the cystoscope in position for obtaining the measurements of the vertex, posterior wall, and left lateral wall (Hunter and Lyon, in Jour. Am. Med. Assoc., Dec. 16, 1899).

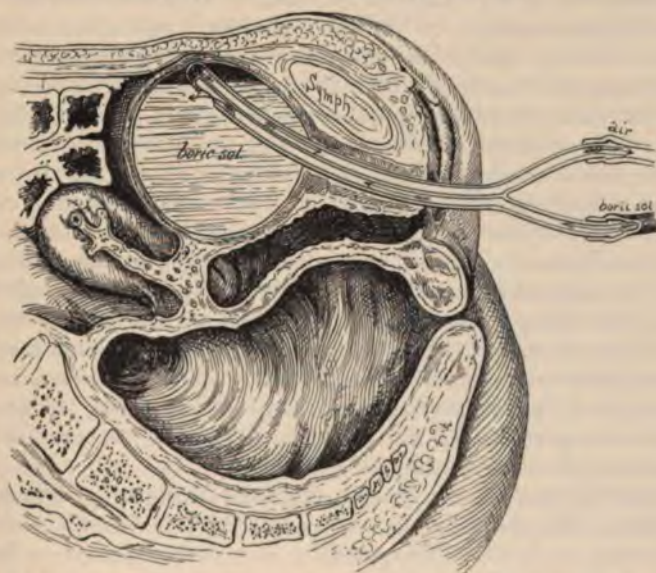


Fig. 69.—Median section, dorsal position, showing the double-barreled catheter in position in the bladder, boric solution entering through the lower chamber and forcing the air out through the upper chamber (Hunter and Lyon, in Jour. Am. Med. Assoc., Dec. 16, 1899).

mum of 160 cc. to a maximum of 545 cc. The capacity commonly follows the size of the bladder by internal mensuration, and also in a general way the size of the woman. Measurement was also made,

in 22 cases, of the fluid contents of the bladder, boric solutions being used for this purpose. On anesthetized patients the solution was introduced through the double-barreled catheter until overflow occurred through the upper barrel; on those without anesthesia, it was introduced until discomfort was caused to the woman. The average fluid capacity was thus found to be 429.7 cc., varying in individual cases from a minimum of 210 cc. to a maximum of 840 cc. The fluid capacity of the bladder was thus found to be more than one-third greater than the air capacity, a difference that would be expected because of the elasticity of the bladder-walls under increased pressure. The bladder as a whole, when dilated with air and observed during operation within the pelvic cavity,—from abdominal section,—was found to be ellipsoid in form, flattened somewhat in its anteroposterior diameter and increased transversely. The transverse diameter was always the greatest measurement. Mathematical calculation of the cubic content of an ellipsoid viscus of the dimensions of the bladder corresponded closely with the actual air capacity obtained by expression. The average length of the urethra in 17 cases was 3.3 cm., the shortest urethra measuring 2.7 cm., and the longest 4.2 cm.

Cystitis.—A. Brothers,¹ in speaking of the diagnosis and management of cystitis in women, referred to the symptomatology of the disease in its acute and chronic forms, and emphasized the fact that with the modern means of exact diagnosis of vesical conditions obscure lesions were no longer a mystery. "Irritable bladder" was now a myth. He had been working chiefly with the Nitse cystoscope, and believed it to have advantages over the Pawlik instrument in that the bladder was directly illuminated and a larger area could be seen in each field. The position of the patient, too, was easy, and no preliminary dilation or anesthesia was necessary. Further, the interior of the bladder was distended by a fixed quantity of antiseptic, transparent medium (boric acid solution). The author then related the various visible changes in the bladder in disease, and said he accepted Casper's classification: (1) Change in color and luster; (2) increased capillary circulation; (3) swelling; (4) changed secretion. Inspection of the bladder was positively contraindicated in acute inflammations, but was allowable in all forms of subacute and chronic inflammations. Brothers narrated in detail the treatment of the various forms of vesical inflammation, insisting upon as early an examination of the bladder-cavity as is permissible for the establishment of an exact diagnosis.

Trophic Disturbances of the Bladder Following Gynecologic Operations.—Mirabeau² calls attention to the fact that the vesical irritation so often observed after operation is usually referred to infection or mechanical injury, while in a few instances it has been due to ligatures which have made their way into the bladder. He reports 2 cases of abdominal section, with persistent vesical symptoms, in which a cystoscopic examination showed general anemia and atrophy of the mucous membrane, evidently due to circulatory disturbances, the arteries being

¹ N. Y. Med. Jour., April 7, 1900.

² Centralbl. f. Gynäk., No. 11, 1899.

abnormally small while the veins were prominent. He inferred that the collateral circulation had not been established as usual after ligation of the vesical arteries. In these cases treatment of the bladder itself may do more harm than good. Massage, the separation of adhesions, and softening of exudates in the neighborhood of the organ are indicated. As a prophylactic measure the surgeon should avoid mass ligatures and ligate the vessels separately as far as possible, sparing those which supply the bladder. [As the majority of surgeons use the mass ligatures and the results here noted are few and far between, this advice is more theoretic than practical.]

The Treatment of Incontinence of Urine in Women.—Ziegenspeck¹ has employed 4 methods in the treatment of dribbling of urine in women, when it is independent of the presence of fistulæ, parametritis, pelvic peritonitis, or cystitis, in which the treatment should be directed to the primary cause: (1) Thure-Brandt's method of massage of the sphincter vesicæ is carried out by exercising energetic vibratory pressure on the urethra and neck of the bladder between the forefinger in the vagina and the symphysis pubis, twice to four times on the right of the urethral swelling, and the same number of times on the left. Two or three applications are generally sufficient to effect a permanent cure, or, at least, great improvement. If these fail, it is useless to continue the treatment. When the massage is painful, the prognosis is good. The other methods are more severe, and are to be used only if massage fails. (2) The sphincter vesicæ may be stretched by passing a metal catheter, and moving it forward, backward, and from side to side (Sänger's method). This succeeded in only 2 cases, and may cause considerable hemorrhage. (3) A temporary suture may be carried round the sphincter with a view to irritating its tissue and forming a circular cicatrix. A bulbous-headed sound is passed, and the neck of the bladder and the sphincter are located by gently withdrawing it. The spot where the bulbous head meets with resistance is noted, and a silk suture is passed from the vagina round the urethra and sphincter. The points of entry and exit should be as close together as possible. A fine catheter is passed into the urethra, and the ends of the silk are knotted firmly. The suture is left in for 8 or 10 days and then removed. Ziegenspeck cured 2 out of 3 cases in this way. (4) Since incontinence may be due to paresis or dilation of the sphincter, the writer has excised a segment in one case with good results. The neighborhood of the sphincter is determined by the bulbous-headed sound, the patient being anesthetized and in the lithotomy position. A vertical incision is made over the sphincter, which is dilated by a full-sized metal catheter. Arterial hemorrhage is arrested by torsion; venous, by pressure. The sphincter is then pulled out of the wound with vulsella forceps, and a piece $\frac{1}{5}$ of an inch long is resected. The muscular fibers which retract on either side of the catheter are brought together over a narrower catheter by catgut sutures. The vaginal wound is finally closed with button sutures. [The method is simple and quite as safe as any other.]

¹ Deut. Aerzte-Zeit., Nov. 15, 1899.

Cancer of the Urethra in the Female.—Ehrendorfer¹ concludes, from a critical study of this subject, that cancer of the urethra is a rare affection. The glandular variety is found in the urethral canal, while the epithelial form originates at the meatus and in its neighborhood. The latter, which the writer terms vulvo-urethral, extends early to the urethra, and does not invade the surrounding parts so widely as epithelioma developing in the vestibular region. It is possible to make these distinctions only in the incipient stage of the disease. Whether different lymph-glands are affected in the urethral and periurethral malignant disease has not been definitely established.

Anastomosis of the Ureters with the Intestine.—R. Peterson,² from a careful historic and experimental research of this subject, concludes as follows: The primary mortality of uretero-intestinal anastomosis both in experimental work on animals and in man is exceedingly high. The best technic is that requiring the least amount of suturing of the ureters themselves. All efforts to prevent ascending renal infection in animals or in man when the ureter has been implanted without its vesical orifice have proved futile. It is impossible to determine in advance the extent of the infection which will result from uretero-intestinal anastomosis. The patient may die in a few days of a pyemia or in a short time of pyelonephritis, or in rare cases may recover from the infection with resulting contracted kidneys. Hence the operation is unjustifiable, either for the purpose of making the patient more comfortable, as in exstrophy of the bladder and vesicovaginal or ureterovaginal fistula, or for malignant disease of the bladder. The results of uretero-intestinal anastomosis through the formation of vesicorectal fistulæ have not been favorable up to the present time. The success of Frank's experimental work in vesicorectal anastomosis justifies the expectation that the future results of this operation will be more satisfactory. The primary mortality of ureterotrigono-intestinal anastomosis is low for an operation of this magnitude. While it can not be denied that ascending renal infection may occur after this operation, the infection, as a rule, is of such a type that the chances of the individual's overcoming it are good. Hence the operation of implanting the vesical flap with its ureteral orifices into the intestine is a justifiable surgical procedure. There is no valve guarding the vesico-ureteral orifice; nor does the circular muscle layer of the ureter, nor do the bladder muscles themselves, act as a sphincter. It has been abundantly demonstrated by experimental and clinical work that the rectum tolerates the presence of urine, and acts as a good substitute for the bladder, and that good control over the anal sphincter is maintained.

MENSTRUATION AND ITS DISORDERS.

Influence of Menstruation upon the Amount of Hemoglobin and the Corpuscles in the Blood.—P. Sfameni³ pursued investiga-

¹ Arch. f. Gynäk., Bd. LVII, Heft 3, 1900.

² Ann. of Gyn. and Ped., May, 1900.

³ Brit. Med. Jour., May 13, 1899.

tions on 6 normal individuals, 4 during one menstrual period only, and in 2 for 4 months. In each case he first ascertained the differences existing between the results of examinations made during the flow; he then divided the intermenstrual period into 3 portions, the first including the 3 days previous to the appearance of the menses, the second the 3 days following, and the third the remaining days. He obtained the following results:

	HEMO- GLOBIN.	RED BLOOD- CORPUSCLES.	LEUKO- CYTES.
Average of results of examinations made during the menstrual period	86.50	5,101,109	6975
Average of results of examinations made before and after the menstrual period	90.58	5,223,552	6672
Difference in menstrual period	4.08	122,443	+303
Average of results of examinations made in the 3 days preceding the menses	90.57	5,321,652	7040
Difference in menstrual period	4.07	129,542	-65
Average in results obtained in the 3 days following the period	90.09	5,220,749	6507
Difference in menstrual period	-3.59	-119,640	+468
Average of results of examinations made during days remote from period	91.00	5,188,542	6682
Difference in menstrual period	4.50	87,633	+293

These results show that the amount of hemoglobin contained in the blood is constantly diminished during the menstrual period, although to a slight extent, being on an average about 4.5%. The amount of diminution is in direct relation to the amount of blood lost during menstruation. The red corpuscles are fewer in number during menstruation than in the intermenstrual period. The leukocytes are increased in number during the flow. Giuseppe Poggi¹ says that the fact that menstruation may influence the hematopoietic function is not unknown, although there have not been many exhaustive researches into the subject. Isolated observations, however, made upon the blood during the menses show that there is an intimate relationship between the two processes. In order to ascertain the modifications which may occur in the blood during menstruation, Poggi instituted a series of experiments upon normal patients, determining the amount of hemoglobin daily with Fleischl's hemometer, during and after the menstrual flow for about a month. The charts show that the curve of hemoglobin is nearly always lowered for a few days before the appearance of the flow, just at the time when disturbances of various kinds are likely to occur. When the flow is established, the hemoglobin reaches the first level. The author is unable to state whether the hemoglobin during the menstrual period is in proportion to the quality or to the intensity of the pain suffered by the patient, but he does state that it bears no relation to the amount of the blood lost. The anemia appearing, as it does, before the flow, it can not be attributed to loss of blood, but must be due to more complicated and recondite causes. The transitory oligochromemia does not continue after the flow; moreover, the 200 cc. (about) of blood lost gradually throughout several days could scarcely account for a lowering of hemoglobin 10 or 15 degrees, which frequently occurs, and, besides, it is very quickly replaced by

¹ Arch. Ital. di Gin., Feb. 28, 1899.

means of the functional activity of the hematopoietic organs. In such small hemorrhages the number of new cells produced may be two or three times greater than that lost. This may be the reason why the curve of hemoglobin, which was lowered during the premenstrual period, rises as soon as the flow is established. The author asks himself whether the diminution of hemoglobin often present during menstruation is not a certain symptom of anemia, since it may be produced by simple constriction of the cutaneous capillaries from vasomotor disturbance. The uterus and ovaries during menstruation especially become the seat of centripetal stimulation, and it is a well-known fact that stimulation of the genital tract may cause the greatest variations in the caliber of the blood-vessels. By experimentation Poggi found that the diminution in the hemoglobin, however, is real, and not dependent upon constriction of the peripheral veins or a displacement of the blood-mass. The lowering of the hemoglobin curve is in relation to the lessened consumption of albumin which occurs in menstruating patients, and is manifested by a diminished elimination of nitrogen through the urine and feces, this diminution taking place a little before the appearance of the uterine hemorrhage, and at the same time as the descent in the hemoglobin curve. The processes of nutritive exchange are therefore retarded during menstruation. This function causes a depression in all the organic functions, the temperature is lowered, the blood pressure is diminished, the nerves, especially the vasomotor nerves, are more torpid, respiration is less easily influenced by external stimuli, the mobility of the stomach is impaired, and muscular weakness usually occurs. Reasoning by analogy, Poggi believes that the diminution of the hemoglobin is due to a retardation in the production of blood. He holds that the nervous system plays an important part in this process, an impulse being transmitted from the cerebrospinal centers to the ganglionic system of the generative organs, and thence to the ovary, this organ being the medium for the special activity of the nerves. Still, it can not be the only factor, since Goodman found a vaginal menstruation in the case of 27 women whose ovaries had been removed. Many other facts go to prove that the nervous system has a marked influence upon menstruation, as, for instance, that intense emotions may suppress or increase the flow. It is hard to say by what mechanism a diminution of hemoglobin occurs at each menstrual period. It might possibly be due to a vasomotor disturbance in the functioning bone-marrow, such as occurs in osteomalacia, produced, according to Fehling, by a passive congestion of the bone tissue caused by stimulation arising in the ovaries. Under the influence of menstruation something similar to this might occur, the congested condition mentioned causing a stasis in the hematopoietic organs, and hence a clearing of the circulation, with a consecutive diminution of the hemoglobin. The latter would then be seen to depend upon a diminution in the number of red corpuscles, but Poggi has not been able to ascertain definitely whether this is the case on account of the uncertain action of the instruments at our disposal.

Sterility.—Reed¹ says that the question as to which is the cause

¹ Am. Med. Quarterly, June, 1899.

and which the effect in a given case of sterility, coexisting with obesity, is best answered by the history of the case, and the antecedent condition may generally be assumed to be the causal one. Thus, in the case of a comparatively young woman who takes on fat and whose increase of weight is followed by a corresponding decline of sexuality, there is logical inference that the first condition is the cause of the latter. This assumption is confirmed when a reduction of the obesity is followed by a spontaneous return of the menstrual and reproductive functions. The physiologic conditions underlying the normal deposit of fat are those of abundant supply of nutritive material, normal digestive functions, a free circulatory activity, an absence of excessive muscular exercise, a normal metabolism, and the unobstructed elimination of metabolic products. When, therefore, in a mature person in whom the nutritive functions have attained a relative equilibrium—and in whom there first occurs a change of type due to the sudden accession of fat—there subsequently occurs a reestablishment of the functions of growth; then follows a disturbance in the balance between waste and supply, the latter being preponderant. With this recurrence of growth there is also a readjustment of function approximating the pre-puberty standard. There is progressive amenorrhea, genital anesthesia, and loss of sexual desire, increasing to the clinical picture of a well-established case of sterility. The prognosis depends much upon the intelligent and persistent co-operation of the patient. The acquired obesity of this class may always be cured practically, while restoration of the genital function is less amenable to treatment. Plethoric cases are more easily cured than anemic, while the most tractable of all are those complicated with neurasthenia. The treatment of sterility due to obesity is both constitutional and local, varying according as the case may be anemic or plethoric, simple or complicated, and must embrace a consideration of diet, exercise, bathing, medication, and general personal hygiene, while the local treatment must embrace all resources that are calculated to overcome manifest pathologic states and to reestablish the functional power of the genital organs. There is no special diet which should be employed in every case without more or less radical change, and any attempt to apply any one of the numerous so-called systems in a routine way is fraught with hazard.

Kisch contributes a supplement on prophylaxis of sterility to the Nobiling-Jankau "Handbuch der Prophylaxe," Munich, 1900. The subject is divided into three parts: (1) Normal germ-formation; (2) conjunction of sperma-nucleus with ovum-nucleus; and (3) incubation of the impregnated egg. *Prophylaxis in reference to normal germ-formation*: Puberty and normal menstruation are the first requisites. The developing maiden usually takes no steps to procure typical menstruation. She is inattentive, liable to imprudence when the sickness is due, keeps no track of dates, etc. The grown woman has more foresight. The menses are to a certain extent a measure of the general condition and ability to conceive. Obese women have scanty menstruation, often none at all; and are often sterile. An anemic or

chlorotic girl probably ovulates normally, but the ovum is not sufficiently congested to rupture the Graafian follicle. It must not be forgotten that acute infectious diseases often cause ovaritis, with destructive Graafian folliculitis. Of numerous diseases known to cause ovaritis at times are syphilis, gonorrhea, phthisis, diabetes, alcoholism, etc. With regard to prophylaxis, the fat woman must be treated for her obesity; the anemic girl must have her blood-corpuscles increased by all roborant measures; the alcoholic woman must be made to renounce her habits, etc. Before a girl is married it should be ascertained that she is nubile in every way. Her sexual development must be perfect. With regard to this point, race and family history may often contribute data. Sterility is less frequent in women between the ages of 20 and 24. It is very common between the ages of 15 and 19. The former interval appears, therefore, to be the period at which marriage should take place. Senile sterility occurs at about 50, rarely much later. Broken-down women who have borne many children and led lives of hardship often undergo precocious senile sterility. Again, those who menstruate late remain single, or, if married, are nulliparous, and undergo senile sterility more frequently than those of opposite qualities. Sterility is less common in couples who are of about the same age. Conception ought to occur, when ovulation and menstruation are normal, about 8 or 10 days after menstruation. Hardly any conceptions occur immediately before menstruation. To secure offspring the husband should maintain continence for a month and then have connection the first day after menstruation ceases, repeating the act daily for several days. Sexual excitement in the woman is much enhanced, both during and after the menses. Schroeder is entitled to the credit of introducing the custom of leaving a portion of the ovary whenever possible in performing major operations on the internal genitals. *Prophylaxis in reference to necessary conjunction of the sperm and ovum nucleus:* During ejaculation of semen a peristaltic contraction of the vagina occurs, which forces that fluid against the os. The uterus descends into the pelvis at the same time, the os opens, and some of the semen is aspirated within the cervix, which latter at the same time pours forth alkaline mucus. It is thus seen that many minor factors come into play in connection with a successful coitus. The ignorance of patients may be so great that a woman long married may occasionally be encountered with an unruptured hymen, neither spouse knowing that this structure must be ruptured before conception is likely to occur. Vaginismus often prevents the intromission of the penis, as does congenital narrowing of the vagina. It is evident, therefore, that dyspareunia must be treated in the prophylaxis of sterility. Active efforts on the part of the wife should contribute to impregnation on physiologic grounds. Sexual frigidity, nonparticipation on her part, are due to one of two things: lack of sensation of ejaculation on the woman's part or rapid escape from the vagina of the semen. Electricity and baths are good stimulants for the anesthesia of the genitals. The act of cohabitation may be varied in some way. To prevent escape of semen from the vagina, the woman

should copulate in the horizontal position with elevated pelvis. Cohabitation in the knee-elbow position will have the same result. In the case of a woman with marked scoliosis, Caspar advised copulation in the prone position, and impregnation was thereby effected after years of sterility. Conversely, coition in the standing posture is most unfavorable to impregnation because of the immediate escape of the semen. Masturbation in girls paves the way for repugnance to coitus, because little or no pleasure is experienced in the latter act. Occasional separation of couples is a stimulus to sexual feeling when cohabitation is resumed, and often leads to impregnation. The husband's semen should be examined in obscure cases of sterility. So the presence or absence of diseases which favor sterility, such as gonorrhea and syphilis, should be determined, and proper treatment instituted. Certain malformations, such as hypospadias, which prevent complete coitus, and may perhaps be curable by operation, should be sought for. In the case of weak ejections, premature ejaculation, etc., aphrodisiacs are justifiably used—strong wines, spices, game, pork, and oysters. Aphrodisiac drugs should invariably be avoided. If the foregoing devices fail, certain mechanical apparatus, as well as artificial impregnation, have occasionally been used with success. Other impediments to fecundity are found in numerous diseased states of the female genitals—cervical tears, endometritis, displacements of the uterus, etc. *Prophylaxis with reference to intubation of the impregnated egg:* It is evident that an ovum can not flourish with ease in a diseased uterus or one which is subdeveloped. "One-child sterility" is a state brought about by one or more accidents incidental to the first labor. Not much need be said of these conditions in this connection. They are either curable through the resources of gynecology, or else absolutely incurable, as in the case of uterus foetalis and similar malformations.

Amenorrhea.—Murrell¹ states his experience with the preparations of manganese. One patient began to lose flesh and become pale. She generally improved on iron pills, but had 3 or 4 attacks of anemia each year. When admitted to the hospital, there was neither constipation nor leukorrhea. The blood was examined by Barlow, who found it of fair color, but thinner than normal. The red corpuscles were 4,520,000 per cubic millimeter, normal in shape and appearance, but pale. The white corpuscles were 7500 per cubic millimeter; chiefly oxyphile, polynuclear cells and lymphocytes. There was, therefore, no oligocythemia, and the condition was one of oligochromemia. The patient was detained in the hospital for 2 weeks under rest and good diet, without improvement. She usually went from 3 to 5 months without menstruating. She was placed on citrate of manganese in 5-grain doses 3 times a day. Prior to treatment she had not menstruated for 7 months, nor done work for about 18 months. She menstruated in 2 weeks after the use of the medicine. In another case the red corpuscles were 3,800,000 in number; and the white, 3000. The patient was ordered manganese citrate—5 grains, to be increased. She rapidly

¹ Med. Press and Circular, Dec. 20, 1899.

improved. Moscucci¹ claims to have secured considerable improvement in both the general condition and the blood of chlorotic patients after exhibition of the fresh ovarian tissue. Beneficial results were also noticeable in dysmenorrhea.

Menorrhagia and Metrorrhagia.—Bouilly² includes under this head hemorrhages which occur in connection with cystic or cirrhotic changes in the ovaries, when the uterine mucosa is apparently normal. The ovarian lesions are divided into 3 classes: viz., Simple cystomas, small papillary cysts, and general sclerocystic degenerations. Metrorrhagia, in connection with the first two conditions, is a symptom of secondary importance as compared with others due to the presence of the neoplasm. When associated with chronic changes in the ovary, without marked enlargement, the true cause of the profuse and prolonged flow is inferred only after repeated examinations and the failure of the ordinary methods of treatment. This form of metrorrhagia is confined to young women, usually nulliparæ, whose sterility, in the absence of any discoverable uterine disease, is inferred to be of ovarian origin. Curetment often shows that the endometrium is healthy. Although the flow may sometimes persist during almost the entire month, it shows a certain regularity in its recurrence, there being a clear interval between the periods, without the persistent sanguinolent discharge which is observed in cases of intra-uterine neoplasm.

In the **treatment of menorrhagia and metrorrhagia**, Nederodoff³ reports 26 cases in which stypticin was used. He began with less than a grain, increasing the dose to 6 grains. If administered hypodermically, from 1½ to 2 grains were used daily. No bad effects were noticed in any instance. The writer concludes that stypticin has a distinct hemostatic action, especially in metrorrhagia, which is not due to the inciting of uterine contraction. It seems to act rather upon the central nervous system (vasomotor). Stypticin is a pure hemostatic, and has no effect on the morbid condition which causes the hemorrhage. Lavi-alle and Ruyssen⁴ think that stypticin is closely allied to hydrastinin in its physiologic action upon the central nervous system. Its hemostatic effect is doubtless due to lowering of the arterial pressure, so that the formation of thrombi is favored. Excessive doses in animals cause complete muscular relaxation and slowing of the respiration, followed by overstimulation and death from tetanus. Beuttner⁵ reports the results of his experiments on rabbits and frogs to determine the therapeutic influence of salipyrin. He also considers the experience of other authors with this drug and its indications. Salipyrin, he believes, is indicated as follows: (1) In menorrhagia (with or without disease of the adnexa); (2) in metrorrhagia (with or without disease of the adnexa), when not due to carcinomatous processes, large tumors, labor, or abortion; (3) in climacteric hemorrhages; (4) in hemorrhage after labor or abortion (endometritis post abortion); (5) in

¹ Accad. dei Fincratichi di Siena, April 24, 1899.

² La Gynécologie, April, 1899.

⁴ Der Frauenarzt, June 16, 1899.

³ La Gynécologie, June 15, 1899.

⁵ Centralbl. f. Gynäk., No. 37, 1899.

threatened abortion ; (6) in dysmenorrhea ; (7) in uterine disturbances, which are neuralgic or appear periodically ; also in all menstrual disturbances, when no organic disease of the uterus is present ; (8) in premenstrual and menstrual psychic depression. Bourcart¹ summarizes the results obtained with gelatin as a hemostatic, since Lancereaux, in 1897, recommended hypodermic injections of a sterilized 1:1000 solution of NaCl containing 1% of gelatin in the treatment of aneurysms, especially aneurysms of the aorta. Since then favorable reports have been made on the hemostatic action of gelatin, given hypodermically, in hemophilia, hemoptysis, purpura hæmorrhagica, and cholemic hemorrhage after operation on the bile-passages. Sireday was the first to employ gelatin as a local hemostatic ; he employed a 5% to 10% solution, and obtained good results in epistaxis and metrorrhagia, either by introducing tampons soaked in the solution or by injecting it directly into the uterine cavity. In other hands favorable results have been obtained in hematemesis, and in rectal and vesical hemorrhages by injecting the solution into the cavities of the viscera. Bourcart has had no experience of the hypodermic method, and would not use it, in spite of the many brilliant results obtained with it, until its harmlessness is completely demonstrated. In a case of hemoptysis so treated in the Geneva Hospital thrombosis of the vena porta was found postmortem. In gynecology, however, he has found a 20:1000 solution of gelatin to be a most valuable hemostatic when applied directly to the interior of the uterus. In a woman aged 43, with chronic metritis and profuse metrorrhagia which had resisted two curettings and injections of iodine and zinc chlorid, and where plugging was required at each menstrual period, a single intra-uterine injection of 10 cc. of the gelatin solution arrested the hemorrhage completely. In a case of profuse hemorrhage during parametritis and left ovariosalpingitis, in which the enlarged uterus was retroflexed and fixed, 2 injections were sufficient. In hemorrhage in a case of retroflexion of a movable atonic uterus the injections arrested the hemorrhage temporarily, although the position of the uterus was not rectified, but they were required with frequent repetition. The injections appear to be most valuable in cases of uterine fibroid tumors, where they may obviate the necessity for a radical operation. Thus, in a woman aged 54, with a large interstitial fibromyoma and fungous endometritis, in which further hemorrhage would probably have proved fatal, 2 injections of 15 cc. of the gelatin solution, introduced through a small gum-elastic catheter passed to the fundus of the enlarged uterus, definitely arrested the hemorrhage. The procedure should be repeated every month, or as soon as hemorrhage returns. Strict asepsis is necessary in carrying out the injections, and afterward a vaginal tampon should be introduced and left in until the next day. The temperature at which the liquid gelatin is injected has no effect on its hemostatic property, and may range from 68° F. to 104° F. For a few days after an injection tiny transparent masses, streaked with blood and evidently composed of gelatin, are passed. The writer has never met with pain, painful uterine contractions, pyrexia, or other ill effects from the injections.

¹ Rev. méd. de la Suisse Rom., May 20, 1900.

Dysmenorrhea.—The phenomenon of **intermenstrual dysmenorrhea**, if mentioned at all in text-books, is stated to be rare. Malcolm Storer¹ has observed this phenomenon in no less than 20 out of 400 cases. He presents notes of 20 cases of his own, and on these and 25 additional cases collected from literature he makes the following observations: (1) The pain appeared with regularity in all the cases, practically every month unless pregnancy was present. In 22 cases the pain always occurred on a certain day from the beginning of the last menstruation. There was a variation in 13 cases of 2 days; and in 4, of 4 days. In 2 cases of irregular menstruation it appeared on a certain day before the beginning of the next menstruation. (2) In 37 out of 41 cases the pain appeared on from the twelfth to the sixteenth day, counting from the first day of the previous menstruation. In 20 cases it appeared exactly on the fourteenth day. In 2 cases it began on from the seventh to the tenth day, in one on the seventeenth, and in one on the eighteenth day. (3) The character of the pain was paroxysmal in a large number of cases, the attacks coming either at intervals of several hours, or else there was a constant pain with marked exacerbations, subjectively much like labor pains. The pain resembled that of menstruation in about one-half of the cases; in the others it was "entirely different." (4) The pain reached its maximum on the first or second day, and lasted in 10 cases, two days; in 9, three days; in 8, one day; and in only 4 did it last four or more days. (5) The site of the pain in 14 cases was limited to one side, in 2 it alternated, and in 12 it was more general. (6) The pain was not accompanied by a discharge like that of menstruation in any of the cases. For this reason the writer objects to the term "intermenstrual dysmenorrhea." In 10 cases, however, there was a marked increase of leukorrhea, indicating congestion. In considering the etiology of this pain, Storer discusses the following theories which have been advanced: (1) The mechanical theory—tubes, ovaries; (2) the neurosis theory; (3) the intermenstrual cycle of congestion theory; (4) the intermenstrual cycle of ovulation theory. Not believing any of these theories to be entirely correct, the writer offers the following theory, which he calls the "awakening of menstrual activity" theory. This intermenstrual pain comes on about the fourteenth day after the beginning of menstruation, which is the nineteenth after the climax of Stephenson's wave. Therefore it occurs just about the time the pressure-line has reached its lowest point. If we then suppose that the intermenstrual wave, if one exists, is one of preparation rather than of subsidence, in which nature, suddenly awakening, begins to make ready for the coming activity, whether menstrual or ovarian, the readjustment of forces might account for the occurrence of this pain. This theory, the writer thinks, would not be incompatible with the fact that this pain occurs under such a variety of pathologic conditions. He cites several cases showing that the pain has more relation to the coming menstruation than to the previous one.

The Menopause.—Hostkiewitz² arrives at the following conclusions

¹ Boston M. and S. Jour., April 19, 1900.

² La Gynécologie, April 15, 1899.

as the result of observations of the menopause extending over 5 years: In certain women the menopause is attended with functional cardiac neuroses; if these are added to preexisting organic lesions, the result may be fatal. Asystole is one of the most important results of these neuroses. Patients with arterial sclerosis, without valvular lesions, resist the climacteric disturbances best, while those with disease of the pulmonary or mitral valves are most affected. Dilation of the cavities of the heart, or of the aorta, tachycardia, and arrhythmia in women at the climacteric do not bear a direct relation to the degree of arterial sclerosis. Aggravation of the cardiac symptoms is observed at intervals corresponding to the menstrual periods, with corresponding periods of amelioration, but the attacks may become severer and more prolonged until they terminate fatally. If menstruation reappears, there is usually a distinct improvement in the symptoms. In general, the disturbed mental and physical condition of the patient at the time of the menopause exercises an important influence upon the cardiac neuroses of this period. Windscheid¹ believes that the climacteric neuroses are essentially hysteric and neurasthenic, as shown by the predominance of the various reflexes. The latter may be due to irritation of the nerve-ends in the ovary in consequence of atrophy and contraction of the tissues. Some of the nervous phenomena are merely a persistence of the ordinary psychic disturbances of menstruation. He regards metrorrhagia as the only symptom which requires special medication. The nervous symptoms are best treated by change of environment, especially high altitudes, warm baths, hydrotherapy, electrotherapy, and massage. He has seen no beneficial results follow the administration of the animal extracts. C. J. Aldrich² believes that the neuroses of the menopause are all the result of intestinal fermentation, and that treatment should consist in antisepsis of the bowel to overcome the autointoxication. Kisch³ states that regulation of the diet has an excellent effect on the vasomotor troubles and the nervous excitability caused by the cessation of the internal secretion of the ovary. The quantity of food should be reduced to a minimum, represented by from 2100 to 2400 calories for a woman of average weight (60 kilos), or 100 gm. albumin, 60 gm. fat, and 350 gm. carbohydrates, and a copious allowance of water. The necessary albumin to maintain nitrogenous equilibrium—1.5 gm. per kilo of body-weight—can be obtained from animal or vegetable albumin; but of the former, all meat rich in extractives (creatin and xanthin), nucleo-albumin, or injurious products of metabolism, especially of ptomains, must be avoided. Thus boiled meat is preferable to roast or baked, and the flesh of young animals (veal and lamb) to that of old. Pork is unsuitable, and game should be avoided on account of the products of decomposition produced while "hanging." All meat-extracts, sausages, smoked meat and fish, and preserved meat should be avoided. Sweatbread, liver, brain, and kidneys are too rich in nucleins. Caviar must be abandoned, as it excites the genital organs, and cheese because it is rich in decomposition

¹ Deutsche Praxis, No. 7, 1899.

² Ann. of Gyn. and Ped., Dec., 1899.

³ Zeit. f. diät. u. phys. Therap., Bd. III, Heft 8, 1900.

products. Kumiss and kephyr are objectionable for the same reason. Fresh fish is allowable. A mixed diet is most suitable, and should contain, compared with meat and fat, a large proportion of cereals, vegetables, and fruit, and practically no spices. From 35 to 55 ounces of pure water should be drunk daily, but no alcoholic liquors, especially if they contain a large amount of extract. Coffee and tea, if taken at all, should be much diluted. It is desirable to have 4 or 5 meals a day at regular intervals, so that but little is eaten at a time, the chief meal being between 1 and 2 P. M. In all cases it is necessary so to regulate the bowels that they do not become confined; hence all foods, such as milk and vegetables, which contain much water are good, and all those containing much indigestible matter, such as leguminous vegetables and chestnuts, bad. Modifications of the diet are necessary in certain cases. In full-blooded women who become corpulent at the menopause, the daily ration, as regards its hydrocarbon and carbohydrate constituents, should be reduced to an average of 12 gm. fat and 120 gm. carbohydrates, while the albumin is increased to 160 gm., the total representing from 1250 to 1300 calories. When the menses cease suddenly or at an early age, and the climacteric troubles therefore begin acutely, it is well to order a diet consisting entirely of milk, except for the midday meal, which may contain soup, roast white meat, young greens, and fruit. In most cases daily baths at 95° F. to 98.6° F., in which the patient remains for from 10 to 30 minutes before bedtime, are indicated; they prevent the tendency to sweating by stimulating the function of the skin, are a sedative to the nervous system, and often produce quiet sleep. Cold baths, on the other hand, are contraindicated.

UTERINE INFLAMMATION.

Isolated Glands Near the Uterus.—J. C. Hirst¹ concludes from original research and a study of the literature of the isolated glands occasionally found near the serous coat of the uterus, as follows: (1) In the uterus of an adult are found embryonic epithelial inclusions from the mucous membrane of the uterine body (Müller's duct), situated in the peripheral subserous layer of the myometrium. (2) Isolated glands and cysts, included in the uterine wall and originating from the mucous membrane, are provided with a cytogenous tissue sheath, but not invariably. (3) This cytogenous tissue is found accompanying remains of the Wolffian body only when adenomatous proliferation is present in them; and this applies both when it occurs at the normal site of the paroophoron and in transposed portions of it. (4) Adenomas with glands and cysts in scattered arrangement (compact arrangement presupposing proliferation) are to be considered as from the mucous membrane as soon as they are provided with cytogenous tissue sheaths around the glands. (5) The epithelial ducts in the uterine and tubal wall, which have heretofore been characterized as aberrant canals from the Wolffian body, have not been proved as such, and are of uncharac-

¹ Am. Jour. Med. Sci., Mar., 1900.

teristic anatomic structure. For this diagnosis we must have specific figures of the paroophoron or connection with Gaertner's duct. (6) The formation of the subserous adenomyomas from these incorporated glands of the uterine mucous membrane is possible.

Movement-cure of Essential Leukorrhœa.—[The rebelliousness of leukorrhœa essentialis to treatment is well known. It appears to be a fact that in low, moist, and marshy countries leukorrhœa is more common and more abundant than in countries exhibiting the opposite telluric conditions. It is also admitted that the lymphatic, anemic, or scrofulous girl or woman is especially predisposed to leukorrhœa. According to D'Epine, 1 woman in 3 suffers from leukorrhœa. According to Schapiro, there is naturally a general laxity of the pelvic tissues, which is distinctly favorable to leukorrhœal discharges, while the vascularization of the intrapelvic tissues is also especially adapted to the same ends. There is abundant evidence that antiseptics, astringents, and caustics are powerless to remove this idiopathic condition.] Schapiro¹ has, therefore, made use of the movement-cure, which is simple and direct, consisting of respiratory gymnastics, with gynecologic massage and movements directed to the removal of circulatory inequalities and congestions. The technic of these proceedings is given in full: The first manipulation consists essentially of flexion and extension of the arms. The operator sits facing the patient and takes her by the wrists. As he raises her arms he commands her to take a deep inspiration. The patient then assumes the active rôle and draws her elbows backward. These movements are then reversed as the patient empties her chest by expiration. The second manipulation requires that the patient, being in the recumbent position, flex the thighs upon the pelvis and the legs upon the thighs. As these movements have relaxed the abdominal walls, the operator, seated on a stool at the patient's left side, introduces his left index-finger into the vagina, under the patient's thigh, and with his disengaged hand executes stroking movements upon the abdominal wall. These frictions are executed in a circle, and are at first superficial, and then deeper. They are always gentle, and the skin is never rubbed, but the viscera are rolled beneath the fingers. The left index-finger meanwhile steadies the uterus. These movements are kept up from 3 to 5 minutes. The third manipulation consists of applying the palms to the external aspect of the knees. The patient has her knees flexed, feet in contact, and the pelvis strongly elevated, and she separates her knees while the operator makes counterpressure. Then, the knees being widely separated, the operator seeks to approximate them while the patient offers resistance. The final series of movements is performed with the operator at the patient's back. He seizes her arms below and gently raises them until they meet in the middle line, while the patient inspires deeply. This movement is then reversed. Schapiro has treated 24 patients in this manner at the Clinique Baudelocque. As patients never (?) seek treatment for leukorrhœa *per se*, it must be acknowledged that most of the women were also suffering from displacements or menor-

¹ Rev. prat. d'Obstet. et de Gynecol., June, 1899.

rhagia. The movements were kept up from 20 days to 7 months ; 12 cases were completely cured, 10 were improved, and 2 were not benefited. [In conclusion, it is evident that leukorrhea may exist independently of inflammation or infection, and that this form may be made to disappear by correcting irregularities of the circulation. The leukorrhea which accompanies displacements and menorrhagia may also exist without any local or general anomaly.]

Treatment of Endometritis.—Woyer,¹ after a thorough study of the reports of the use of ichthyol in gynecologic practice, considers that we have in this drug an incomparable antiphlogistic with a striking anodyne action. With regard to the conditions in which ichthyol has proved of the greatest service, and to the mode of application of the drug, the ichthyol-glycerin tampon has a prompt anodyne action in parametritis, in chronic pelvic cellulitis and peritonitis, and in affections of the adnexa. In these cases he also makes use of abdominal frictions of ichthyol-lanolin ointment. The drug is of benefit in inoperable uterine cancer, diminishing the exudate and quieting the pain, as well as exerting a deodorizing action. In fact, he considers that ichthyol is nothing less than a specific for parametric pain. B. Fenwick² states that the methods which he has found most suitable and which give the greatest relief by local blood-letting in pelvic disease are: (1) By scarification of the cervix when that part presents a deep-red, bluish, or purple appearance, evidencing much or long-continued congestion of the uterus, always remembering, of course, to make sure that the condition is not due to pregnancy; (2) by cupping or leeches over the ovaries, when throbbing, burning pain in these regions is the chief or only symptom; (3) by leeches around the anus in cases where the *fons et origo mali* evidently is the presence of inflamed hemorrhoids, prolapsus recti, inflamed carunculæ myrtiformes, and similar congestive conditions.

Intra-uterine Douching.—Gesna³ has collected 120 cases of metritis treated by free intra-uterine injections. It has been employed with success in all varieties of the disease—simple, complicated, acute, or chronic. He admits that in exceptional cases it has caused uterine colic, serous discharge, menorrhagia (moderate or severe), and sometimes a “slight peritoneal reaction.” Gesna holds that these complications [which he is certainly right to note as a warning] are of little importance. Inflammatory lesions of the appendages are not, in his opinion, contraindications to this treatment, unless they are suppurative; then the pus must be evacuated before the injections are commenced. The collected cases treated—all with perfect success, as far as the metritis common to all was concerned—are thus classified: Simple acute or chronic metritis, 21 cases; hemorrhagic metritis, 23; metritis with diseased appendages, 45; metritis with uterine displacement, 20; and metritis with pelvic abscess, 10 cases. Blondel, in a review of this thesis, adds that the author should have added acute gonorrhea as an absolute contraindication to washing out of the uterus; the treatment

¹ Wien. med. Presse, Nov. 19, 1899.

² Med. Times and Hosp. Gaz., Nov. 25, 1899.

³ Thèse de Paris, 1899.

has in suitable cases, besides those collected by Gesna, been largely adopted with success of late years.

A. H. Goelet¹ declares that it is an error to regard every uterine discharge as an evidence of endometritis, and to treat such conditions by caustic and astringent applications, which coagulate the discharge and defeat drainage by blocking the orifices of the glands. This and destructive curettage he designates as unscientific. Hyperemia with hypersecretion, often mistaken for endometritis, requires no local application to the endometrium—in fact, it is often converted into an endometritis by such treatment. The danger of inserting instruments into the uterus for the purpose of diagnosis, for treatment, or for operations, when there is a so-called catarrhal endocervicitis, is pointed out. He declares that the staphylococci, streptococci, and gonococci are often found in the cervical secretion when it is most inoffensive in appearance, and that their presence or absence can be determined only by microscopic examination of the discharge. This method of examination should always be employed in these cases before the cavity above the internal os is invaded, either for the purpose of diagnosis, treatment, or operation within the uterus. In endometritis the disease is not confined to the surface, but has invaded the glandular structure beneath, and Goelet believes the rational treatment is to free the orifices of the glands and drain them until the infective process is exhausted, at the same time employing repeated irrigation with some nonastringent, nonirritating solution to remove the expelled secretion from the surface and prevent the migration of the infective germs. This may be accomplished by a carefully executed curettage, done in such a manner as not to destroy the mucosa, but merely for the purpose of removing projecting granulations upon the surface or superfluous tissue that may be blocking the orifices of the glands and preventing the drainage. The dull curet with a rigid shaft is sufficient, and the sharp curet should not be used upon the endometrium of the cavity in endometritis. It is both unnecessary and unwise to attempt to remove the entire mucous membrane, and caustic applications should not be used after curettage in these cases. They cause necrosis and atrophy of the mucous membrane, or agglutination of the sides of the cavity may result. He urges that curettage should be regarded only as a preliminary step in the treatment, and that more attention be given to the after-treatment, this to consist of persistent drainage and irrigation until all evidence of disease, as revealed by a microscopic examination of the secretion and an inspection of the cavity by means of the uterine endoscope, has been effaced. He also urges endoscopic examination of the cavity both before and after curettage: before, to decide the actual necessity for it; and after, to determine the completeness or incompleteness of the work. Goelet exhibited a uterine endoscope with a small electric lamp placed at the extremity of the tube for direct illumination of the interior of the uterus, after the plan of the Valentine urethroscope. A megaloscope was attached for bringing out more prominently the details of the surface.

¹ Phila. Med. Jour., June 10, 1899.

Atmocausis.—Flatau¹ does not speak enthusiastically of the steam-cautery. He has carefully investigated the instrument and the changes which boiling steam effects on the tissues. Especially important is his opinion that when the atmocautery is at work in a patient's uterus, it does not discharge boiling steam at all, but simply spurts out very minute drops of water at a considerably lower temperature. Atmocausis can not be applied long enough at one sitting to insure destruction of bacteria. Its efficacy also depends greatly on the consistence of the uterus, the size of the uterine cavity, and the nature of any uterine hemorrhage present. It answers best in interstitial endometritis, in the so-called preclimacteric hemorrhages, and in inoperable cancer of the cervix. Atmocausis can not be depended upon to destroy the whole endometrium, after the fashion of many caustics. The method is inapplicable when perimetritis or parametritis is present, even if chronic, nor should it be attempted in sepsis after abortion until the uterus has been entirely cleared of the products of conception. Its use in myoma is very questionable, nor is it easy to understand how it can act as a prophylactic against cancer. Flatau concludes by stating emphatically that atmocausis can never take the place of the curet, though it may be useful in conjunction with that instrument. After considerable personal observation in conjunction with a survey of the literature of the subject, Brothers² concludes that as a hemostatic, intra-uterine vaporization, or vapo-cauterization, has been employed most successfully in cases of nonmalignant, postclimacteric uterine hemorrhage. It has proved curative in the various irregular bleedings encountered in connection with catarrhal, fungoid, or hemorrhagic endometritis. It acts as a palliative measure in certain cases of fibroid tumor or inoperable carcinoma associated with hemorrhages. As a caustic, vapo-cauterization can be relied upon to destroy the mucous lining of the uterus, even to the extent of obliterating the uterine canal. As a bactericide, the procedure may be employed in cases of gonorrheal or septic puerperal endometritis. The uterus subjected to vapo-cauterization and subsequently removed by excision has, when examined bacteriologically, been found sterile. Vapo-cauterization has frequently been employed successfully to reduce the bulk of the sub-involuted uterus, and in some cases of chronic suppurating abdominal fistula which had resisted other means of treatment. Czempin³ publishes an important report of a uterus removed with a myoma and a tubo-ovarian cyst two months after the patient, aged 33, had undergone treatment by injection of steam into the uterine cavity. He exhibited sections of the uterus before a German society. The vaporization had, it appears, been carelessly applied, and to the naked eye it was clear that the mucosa of all the cervix and the greater part of the uterine cavity was reduced to cicatricial tissue, but there was in the uterus a small excavation of doubtful nature, which seemed as though caused by a myoma. On microscopic examination the cicatricial atrophy became more evident, but at the excavation the mucosa had been restored, though in a remark-

¹ *Monatsch. f. Geburtsh. u. Gynäk.*, Sept., 1899.

² *N. Y. Med. Jour.*, May 13, 1899.

³ *Centralbl. f. Gynäk.*, No. 2, 1899.

ably lower type. The epithelium had been replaced, but the subepithelial tissue was very scanty, contained but few vessels, and had lost all its glands. Czempin suspects that this condition of the endometrium exists in subjects in whom vaporization has been practised until the uterus has become atrophied and menstruation has been permanently stopped, yet the uterine cavity remains permeable for the sound.

UTERINE DISPLACEMENTS.

Anteflexion.—T. J. Bell,¹ in discussing cervical flexions and their importance from a pathologic point of view, concludes as follows: Cervical flexions do not command the attention which their importance demands; they are often overlooked as being the cause of dysmenorrhea and sterility. Anteflexion of the uterine body is of very rare occurrence, and this, as well as corporeal retroflexion, is a mechanical impossibility without prolapse. The first cause leading up to anteflexion lies in faulty development, and an elongated conic cervix always means faulty development. Dysmenorrhea in unmarried and married women, with sterility in those who are married, should raise a suspicion of flexion at the internal os. Physicians should advise the correction of flexions in both married and unmarried women, at the earliest possible moment. The method of correcting them, whatever it may be, must be thorough. In the treatment of anteflexion, W. L. Burrage² lays down the following rules for guidance in these cases: (1) In anteflexion without ovarian or tubal disease, and free from shortened uterosacral ligaments or posterior adhesions, dilation, curetting, and Dudley's operation or amputation of the cervix, with a preference for the former. (2) In anteflexion with retroposition and shortened uterosacral ligaments or posterior adhesions, and without ovarian or tubal disease, dilation, curetting, and division of the uterosacral ligaments or adhesions by colpotomy and Dudley's operation or amputation of the cervix, with a preference for the former. Amputation of the cervix is a useful operation when the cervix is very long, and also when there is extensive erosion of the crown of the cervix. In married women in both of the foregoing classes dilation and curetting, without other operation, are sufficient, because pregnancy will usually straighten the uterus and stretch the ligaments and adhesions. Should pregnancy not supervene within a number of months, and should the symptoms persist, another curetting and Dudley's operation, with or without division of the ligaments, may be done. (3) In anteflexion, with or without retroposition, having ovarian or tubal disease, dilation, curetting, Dudley's operation, and suspensio uteri, the uterosacral ligaments being divided through the abdominal wound if they are shortened and whatever may be necessary done to the ovaries and tubes.

Uterine Prolapse.—Von Herff³ was able to trace 253 out of 283 cases of prolapse treated at the Halle Clinic between 1894 and 1898.

¹ Ann. of Gyn. and Ped., Jan., 1900.

² Boston M. and S. Jour., Mar. 8, 1900.

³ Centralbl. f. Gynäk., No. 41, 1899.

The usual operations were amputation of the cervix, with anterior and posterior colporrhaphy, often supplemented by vaginofixation or vesicofixation. Ventrofixation was employed only after other methods had failed, or when it was necessary to open the abdomen for other purposes. Hysterectomy was confined to the most obstinate cases. Freund's operation was not successful. Cases were regarded as cured only when no prolapse of the vaginal walls was noticed on severe straining. Of the lighter cases, 50% were cured, while in 15% of the bad cases the patients were able to perform their usual work. Relative cures were obtained in 78% after vaginofixation or vesicofixation, and in 77% after both plastic operations and ventrofixation. Subsequent labors caused the greatest number of recurrences (28.9%). Cystocele returned most frequently; less often, prolapse of the uterus; and rectocele least frequently of all. The principal cause of failure is relaxation of the tissues—a factor which can not be eliminated, although the tissues may be strengthened by gymnastics. Imperfect restoration of the pelvic floor, nonunion, and fresh lacerations which are not properly repaired are also responsible. Von Herff regards a firm perineum and a narrow vaginal outlet as most essential to a permanent cure. G. Parlavechio¹ describes the cure of uterine prolapse by the Mazzoni process, which consists in laparotomy and then in lifting the uterus as high as possible and passing a strong silk thread into the uterine substance at the point of insertion of the round ligament of each side. The peritoneal wound and that of the rectus muscles having been reunited, the two loops of silk, which have been brought up through the rectus muscles and their aponeuroses, are drawn upon, and each is tied separately. The abdominal opening is then closed. R. C. Chicken² calls attention to the fact that even vaginal hysterectomy will occasionally fail to cure uterine prolapse on account of the anatomic conditions that are present: namely, the relaxed condition of all the pelvic tissues. The burden practically falls on the broad ligaments. The entire removal of the uterus is ineffectual unless the cut surface at the base of the bladder forms peritoneal adhesions high up instead of to the raw edge formed by the posterior primary incisions. He recommends the removal of a part only of the uterus, and the removal of the unattached portion of the posterior fornix. The points for which he claims advantage are: (1) The leaving behind of a solid piece of uterine tissue. (2) The transverse cut across the uterus, allowing of easy retroversion of the fundus and facility of applying ligatures to vessels. (3) The removal of the whole of the floor of Douglas' pouch. (4) The incision in the posterior fornix being made as far back as possible; the resulting scar admitting of no "play" between the bony pelvis and the neck of the bladder.

Retrodisplacements of the Uterus.—*Etiology.*—Camillo Fürst³ discusses the effects of bodily strain on the uterus and its appendages. His observations show that considerable transient, as well as long-continued and moderately increased, intra-abdominal pressure is a prominent factor

¹ La Clinica Ostet., Jan., 1900.

² Brit. Med. Jour., May 26, 1900.

³ Klin. Vorträge, No. 253, 1899.

in the development of retroversion. On the other hand, there is no doubt that previous pregnancies furnish the chief predisposition. It is well known to every gynecologist that retroversion of the uterus in the virgin is by no means a rare occurrence among the better class—a fact which must be attributed to the long-continued sitting posture in a tightly laced condition that young girls assume during school hours. If such women adopt the bicycle as a means of recreation, they will find its effects invariably baneful. The author considers that swimming is the exercise most apt to counteract these injurious effects. Furthermore, Fürst has found that there is a certain immunity against retroversion in women with occupations in which the intra-abdominal pressure is lessened for continuous periods, as, for example, in floor-scrubbing. He has also noticed that women in the lower walks of life, who are obliged to do their own housework, and who, while their work may be quite heavy at times, are forced to change their posture continually, are no more frequently subject to retroversion, despite all their hardships, than their better-situated sisters. For these reasons the author has for many years made use of the knee-elbow position for suitable cases of this description. Particularly well adapted for this treatment are those cases in which the manual reposition is impossible without narcosis, at least in the beginning, on account of the extreme hyperemia and sensitiveness of the uterus, or on account of the extreme softness of the organ. With reference to inflammation of the uterine appendages, the author shows by his statistics that the cause for this condition is to be found principally in great bodily exertion, such as lifting heavy burdens or sustaining concussions. A remarkable point shown by his statistics is that parametritis occurs more than twice as often on the left as on the right side. Such left-sidedness seems, in fact, to be characteristic of parametritis. He thinks it quite possible that this is due to the more frequent use of the right upper extremities in the execution of heavy work, since thereby the lower part of the trunk assumes such a position as to force downward the left parametrium further than the right because of the increased intra-abdominal pressure. His experience has shown that in instances where both arms are equally employed, the disease occurs with almost equal frequency on the right and left sides.

Oliver¹ states that it is impossible to define in accurate terms the *normal position of the uterus*; that the body of the uterus should not rest as a passive weight upon any of the neighboring organs, nor is it, in turn, expected to prop up the superimposed viscera. All the organs of the body are retained in position by adhesive affinity. So long as the integrity of those tissues on which the maintenance of the natural position of the uterus depends is preserved, then this position is not appreciably affected by any of the ordinary alterations in the posture of the body of the female. Attention is drawn to the part played by the broad ligaments, to the existence of a tissue-tension between the neck of the uterus and the vaginal canal, to the part played by water in maintaining cell-tension and in carrying on the

¹ Brit. Med. Jour., Nov. 18, 1899.

nutritive and depurative processes, and to the importance of the mutual tissue-tension displayed by the uterine tissue and its peritoneal envelop. During gestation the uterus is virtually a growing organ, and the tendency for a retroverted uterus under such circumstances to assume spontaneously an erect position is attributed to turgescence. After death the uterus commonly becomes retroverted. This is brought about by loss of water by evaporation, and other physicochemical changes consequent upon the cessation of life. The mutual tension which exists between the uterine tissue and the serous membrane is likened to that displayed by many other organic structures, such as the stalk of the dandelion flower and the leaf-stalk of rhubarb. In the organic world it is difficult to find another structure circumstanced like the uterus, but the hump on the camel's back bears some analogy. Retroversion is frequently observed in association with more or less marked prolapsus when the beneficial influence exerted by the staying and resisting powers of the vaginal canal is practically withdrawn. The importance of osmosis in maintaining turgescence is referred to, and it is considered probable that some disturbance of this phenomenon, allowing of a too rapid filtration taking place, might account for the sudden production of version of the uterus from physical shock. It was pointed out that in the vegetable world cell-tension might in this way be rapidly diminished. The motile cells in *Mimosa pudica* might be readily disturbed by shocks. It was pointed out that the peritoneum is a highly elastic structure, and that that portion of it which envelops the uterus and enters into the formation of the broad ligaments is in its natural connection passively extended, and that this passive extension plays an important part in maintaining the natural inclination of the uterus. This elastic property might not only be impaired but lost, and he alleges that the spontaneous rupture of certain cysts of the ovary and of the uterus during pregnancy is sometimes due to this change in state. The artificial cells formed by the so-called precipitation membrane of Traube burst on account of the increasing internal hydrostatic pressure and the inelastic character of the cell-wall. When the elasticity of the serous covering of the uterus is unduly diminished or lost, then the mutual tissue-tension, which plays so important a part in preserving the rigidity of the organ, is annihilated, and the organ under such circumstances is less capable of withstanding the influence of adverse forces, and will assume that position which the resultant of these might determine.

The Use of Pessaries.—Johannovsky ¹ says that, although modern gynecology seeks to correct permanently uterine displacements by operation, much can be accomplished by the pessary under suitable precautions, the first of which is antisepsis. Pessaries once used should always be sterilized by prolonged boiling; if the finish is injured, they should be reburnished. The instrument must be surgically clean when introduced. Although the vagina carries this foreign body really well, full antisepsis is observed only by douching with weak antiseptic solutions once or twice daily. Again, every 3 or 4 months a change of pessary

¹ Med.-Chir. Centralbl., April 13, 1900.

is absolutely imperative. Choice of pessary is a matter of experiment in each case, best approached by first taking rather a small than a large one, as the latter are more difficult to retain and frequently cause discomfort and damage. Contraindications to their use are inherent in infectious vaginitis, and in acute and subacute inflammation of the uterus and its appendages. Respect for the periods of a woman's physiologic life must be had. Virgins should be subjected to them only in extreme need, and the pregnant solely for the first 3 or 4 months, unless a simple prolapse of the vaginal walls is under treatment. Such patients wear them to term. None should be used earlier than the third week of the puerperium. During the climacteric the number and length of time should be gradually decreased owing to the process of involution. Hard rubber is the best material. As to the type of pessary, the recommendations are as follows: The Hodge is the best of all, especially for mobile, reducible retroflexions. The Thomas, as originally designed, should be used as a reserve instrument, when the former fails, and usually in cases of marked relaxation and thickening of the posterior vaginal wall and of small, freely movable, virgin uteri. The Mayer ring fulfils an indication in cases of descent with old pelvic peritonitis when the other types cause pain. Soft rubber may be used in this kind when the hard can not be borne. The sieve or cup-pessary of Schatz supplants the former only when the weight it carries is light, as when the involution of the climacteric is complete, and in old virgins with atrophic organs. If too heavy, it causes pressure-necrosis and is dangerous. Other mechanical means of uterine support are dangerous, and the use of the occluding pessary of Mensinger, for the prevention of conception, is allowable only for highest professional reasons.

Surgical Treatment of Retrodisplacements.—*Inguinal Operations.*—A. Goldspohn¹ shows that so far as the methods of fixation and suspension of the uterus are efficient, they are very prone to lead to serious complications in the event of subsequent parturition or to invite intestinal strangulation, and that, so far as they do not tend to bring about such troubles, they are rendered ineffectual by the evolution of the uterus in case pregnancy occurs. He would therefore limit all such operations to women who either are barren to begin with, or who can justifiably be made so at the time of the operation. Practically, he would restrict them to instances of decided prolapse giving rise to serious suffering. There is one procedure, however, which Goldspohn thinks free from objection—that of shortening the round ligaments for retroversion; but it is an operation far more extensive than Alexander's. It resembles the Bassini operation for hernia, and is called by the author the "improved and extended Alexander operation." He states that he first performed it in September, 1893, when he removed a diseased Fallopian tube and ovary through the internal inguinal ring. It was not until 1898 that he published a description of it. In an Alexander operation he now always dilates the internal abdominal ring, if only for exploratory purposes. He is thus enabled to free the adnexa if there are adhe-

¹ Jour. Am. Med. Assoc., July 22, 1900.

sions, remove the Fallopian tube with or without the ovary, raise and suspend a prolapsed ovary, or effect salpingotomy. In one instance he has removed a tubal gestation sac, which was on the point of rupturing, leaving the ovary, the only one the woman had. He always closes the wound in the same way as after a Bassini operation for hernia, and thereby, he says, "We not only avoid the supervention of hernia, but incidentally cure a number of inguinal hernias that are impending or are fully developed." From January 1, 1897, to May 29, 1899, he performed the operation 65 times, and without a death. A. H. Goelet¹ says that posterior dislocation of the uterus sooner or later will lead to chronic invalidism, unless promptly and permanently rectified. Pessaries do little good in this condition, though they may be of temporary benefit in recent cases. At best, they are only a makeshift. The pessaries are useful only when there is subinvolution, with a consequent relaxation of the ligamentous supports, and when there is a hope of altering these conditions by treatment. None of these conditions can be considered cured unless the uterus is held in a normal anterior position without artificial support. The objections to shortening the round ligament in posterior displacements would not have been so pronounced if the indications for the employment of this operation had been better understood. The technic for the original operation of shortening the round ligaments has been so greatly modified and improved that it has become an ideal operation. The technic of this operation is as follows: An incision 1 inch in length is made over the internal ring, parallel with Poupart's ligament. This extends to the external oblique muscle. The ligament serves as a landmark. An incision is made into the aponeurosis of the external oblique muscle, $\frac{1}{4}$ of an inch long and about two lines above Poupart's ligament. A blunt hook is inserted and the ligament is caught up and brought out. To avoid handling the ligament, a stout pedicle ligature is passed through the loop as soon as it is drawn up through the incision, and the two ends are caught with the hemostatic clamp close to the ligament. Traction is then made on the round ligament, and the peritoneum that is drawn out with it is stripped backward. The ligament should be drawn out sufficiently to bring the fundus well forward, and the amount of redundant ligament will measure from 5 to 7 inches. When drawn out, the first sustaining suture is introduced. This is silkworm-gut, and secures the ligament as it emerges through the incision in the roof of the inguinal canal. It is passed from above downward, and enters the integument $\frac{1}{4}$ of an inch from the upper margin of the incision. The redundant loop of round ligament is secured by being woven under the fibers of the external oblique muscle. A second suture is inserted through the integument, and penetrates the thick portion of the round ligament. The operation made in this way can be done in from 15 to 20 minutes on both sides. Owing to the fact that the parts are handled but very little, union by first intention is the rule. The sutures can be removed on the tenth or twelfth day, and the patient permitted to get up at the end of 2 weeks.

¹ Phila. Med. Jour., April 28, 1900.

The operation is applicable only when the uterus is freely movable and can be held in a corrected anterior position by a vaginal pessary. Out of 150 cases operated upon by this method, there have been no failures and no relapses. The use of a pessary for a month or 6 weeks after the operation is enjoined, to afford time for contraction of the uterine supports and as an additional safeguard against prolapse, the round ligament only serving to hold the fundus forward.

Abdominal Operations.—Ferguson ¹ describes as follows the successive steps in an operation for the correction of uterine displacement: A skin-incision 3 inches long is made in the median line, beginning $1\frac{1}{2}$ inches from the symphysis pubis. The linea alba and the anterior sheath of the recti muscles are exposed, and an incision is made on each side through the anterior sheath of the recti. The rectus muscle is retracted outward, and an incision is made into the peritoneal cavity directly behind it, through the transversalis fascia and the peritoneum. The round ligament and a portion of the broad ligament are seized with forceps 1 inch from their origin, the round ligament and the broad ligament external to the forceps being tied and divided between. The tied distal end of the round ligament is dropped into the peritoneal cavity, and the proximal end is lifted well out of the wound into the peritoneum. The round ligament and its accompanying portion of the broad ligament are attached to the wound in the transversalis fascia and peritoneum. The fibers of the rectus muscle are replaced and the wound is closed in its anterior sheath with a continuous catgut suture, which grasps the cut end of the round ligament. The opposite end is treated in the same manner. Then the skin-incision is closed. Walter P. Dorsett ² calls attention to a method of ventrofixation practised by himself which, he says, differs from ventrosuspension as originated and practised by others. The patient is anesthetized by chloroform and placed in the Trendelenburg position, the abdomen and pubes having previously been cleansed and prepared according to the approved aseptic methods of the day. An incision, ranging in length from $3\frac{1}{2}$ inches to $4\frac{1}{2}$ inches, according to the thickness of the abdominal wall, is made in the median line, greater care being taken than is usual to follow the linea alba. As soon as the abdominal cavity is reached, the right hand is introduced with the palm looking toward the pubis. Adhesions are now sought for, and if any are found, they are divided by inserting and cutting between ligatures. If the tubes and ovaries are diseased, they are resected or removed. The uterus is then lifted up by grasping it at or a little above the fundus, with the thumb on the anterior surface and the fingers on the posterior surface. It is now held forward and upward by a double tenaculum-forceps attached at the fundus by the assistant. A double curved needle, armed with an ordinary kangaroo tendon, is now inserted and passed through the sheath of the rectus muscle on the anterior aspect of the rectus, and passed around the inner border of the rectus, emerging from the posterior layer of the sheath about $\frac{1}{8}$ of an inch under the inner border, in order to grasp from $\frac{3}{4}$ of an inch to 1 inch of the

¹ Jour. Am. Med. Assoc., Nov. 18, 1899.

² Am. Jour. Obst., Dec., 1899.

sheath. It then passes out of this sheath and through the subperitoneal fat and peritoneum, emerging about $\frac{1}{4}$ of an inch from the incision. By following this course the attempt is made to grasp the sheath of the muscle only and avoid taking in the muscular fibers. The needle is now inserted at a point about $\frac{1}{8}$ of an inch to the right and below the center of the fundus, on the anterior and not the posterior wall, and emerges at a corresponding point on the left side of the organ, and passes through the same structures as in the opposite side of the incision in the anterior abdominal wall, but in a reverse order. The sutures are now held by catch-forceps until other steps in the operation are completed. From one to two more such sutures, placed about $\frac{1}{2}$ of an inch apart, are taken. The next step in the operation is the introduction of the closing sutures, which are of silkworm-gut. Before closing the abdomen the parietal peritoneum and the peritoneal covering on the anterior wall and the anterior portion of the fundus are scarified with a bistoury. The peritoneum is closed by a running suture of catgut. The order of tying the sutures is: (1) The running suture in the peritoneum; (2) the kangaroo tendons; (3) the silkworm-gut closing the walls *en masse*. In the execution of this operation care should be taken not to attach the uterus too high up, lest the tension be too great; also, to guard against too deeply piercing the uterus with the needle, for fear of penetrating into the cavity of the organ.

FIBROID TUMOR OF THE UTERUS.

The Varieties of Uterine Neoplasms and Their Relative Frequency.—W. Roger Williams¹ sums up the results of a statistical investigation of new growths of the uterus. The great frequency of uterine tumors may be gathered from the following facts: Of 13,824 patients of both sexes with primary neoplasms, consecutively under treatment at 4 large London hospitals, 2649 were of uterine origin, or 19.2%, those of the mammæ being 15%. Gurlt analyzed in a similar way 13,971 neoplasms occurring in the chief Viennese hospitals, and found that 4115, or 29%, arose in the uterus, and in the mammæ 11%. Schroeder shows that in 19,666 cases of cancer in women 33.3% were of the uterus, and Simpson (8746 cases) makes the percentage 34.3. In the author's list of 9227 females, 2649 were affections of the uterus, or 28.7%; a further analysis of the 2649 cases of uterine neoplasms shows that 1571 cases were cancerous and 2 sarcomatous, the remainder being myomatous (883) and polypoid (191). Of Gurlt's 4115 uterine new growths, 3449 were cancers, 8 sarcomas, 481 myomas, and 175 "polypoid pseudoplasms." In females malignant neoplasms occur in greater relative frequency than nonmalignant ones (54% to 45%). Although the proneness of the uterus to originate cancer, as compared with its proneness to originate other neoplasms is above the average for females in general, yet it is much surpassed in this respect by the stomach and mammæ. The liability of the ovaries is quite insignificant. There is a

¹ Bristol M.-Chir. Jour., Dec., 1899.

great relative proneness to nonmalignant growths; with this must be contrasted the almost complete immunity of stomach and ovaries from such growths. On the other hand, the liability of the stomach and uterus to cystic disease is almost infinitesimal, whereas ovarian cystoma is a most frequent and well-marked disease.

Formative Period of Uterine Fibroids.—Grace P. Murray¹ says that there is a possibility of determining by definite clinical symptoms the formative period of uterine fibroids. The predisposing causes of race, age (other than that of adult life), or condition count for little, and the elaborate reports which form the bulk of the literature up to the present time are of doubtful value. Chronic inflammatory conditions of the endometrium, of the uterine parenchyma, and of the ovaries and tubes are powerful predisposing causes. There is a direct relation between the uterine hyperplasia and the formation of fibromyomas. Insomnia, headaches, and hyperesthesia are conditions which frequently precede and accompany the formation of fibroids. The size and rapidity of growth of a fibroid depend on its blood-supply, which is determined by the location of the nidus. Conditions such as pregnancy and the menopause have comparatively little influence.

Changes in the Endometrium in Fibroid Uteri.—Barremans² does not agree entirely with those pathologists who affirm that fibromyomas are usually accompanied by glandular endometritis. He has found that while the deeper layers of tissue show a glandular change, the more superficial present the microscopic appearances of an interstitial endometritis. Under increased blood-pressure, or venous obstruction, the vessels may rupture when the glands in the deeper layer are found to contain blood-corpuscles and coagula. The glands invade the subjacent muscular layer, and may even invade the myoma. This hyperplastic form of endometritis is the rule; the mucosa is seldom atrophied except when it is strongly compressed by fibromatous nodules.

The Relations of Organic Affections of the Heart to Fibromyoma of the Uterus.—T. Wilson³ calls attention to the necessity for observing the possible evil effects produced on the other organs of the body by the growth of the uterine fibromyomas. He showed that the conjunction of serious organic affections of the heart with the presence of a fibroid was sometimes casual, but in a much larger number of cases the connection between the diseases of the two organs was causal, the heart affection being set up by the growth of the fibroid, or both being dependent on a common cause. Occasionally the heart might be affected directly, or it may be affected by the pressure of a large cystic fibroid, or indirectly by a tumor pressing on the ureters and so leading to renal degeneration, which in its turn leads to cardiac changes. Much more commonly a fibroid of moderate size leads through menorrhagia to anemia, and thus to cardiac dilation or degeneration; or, again, in the early stages of the growth of a tumor cardiac hypertrophy might be found, and this latter might give place to dilation and degeneration. It is not at present

¹ Med. Rec., Dec. 2, 1899.

² Rev. Internat. de Méd. et de Chir., No. 6, 1899.

³ Lancet, May 12, 1900.

understood how the hypertrophy is brought about, but the condition is in some degree analogous to the enlargement of the heart found in pregnant women; there is the important difference, however, that the causative affection (pregnancy) in the latter case is definite in duration, whereas the period of active growth of a fibroid is indefinite. Wilson describes the case of a patient who had an interstitial fibroid for $4\frac{1}{2}$ years; there had been several attacks of retention of urine, and the symptoms of cardiac weakness were decidedly increased by ergot. Double oophorectomy was performed, and was followed by alarming heart failure lasting several days. The patient eventually made a good recovery, and the condition of the heart showed a gradual but very marked improvement. Six other cases in which organic disease of the heart was apparently caused by the growth of fibroids were briefly related. The nature of the cardiac affection, the varieties of uterine fibroids which were present in the case, the cardiac symptoms and signs, and the course and prognosis were then in turn considered, and it was pointed out that after a successful operation the heart tended to recover its tone in a really remarkable degree. The presence of the cardiac disease favored the occurrence of thrombosis both before and after operation; it formed a contraindication to the use of ergot in the treatment of the fibroid, and it might be an important and even urgent indication for operative interference. When an operation is undertaken, every effort must be made to reduce as far as possible the severity of shock and the risk of subsequent heart failure, and ether should be the anesthetic administered.

Adenomyomas of the Female Sexual Apparatus.—In his studies of the origin, nature, and destiny of the adenomyomas of the female sexual apparatus, Leopold Landau¹ has developed some new knowledge of an old subject. The new matter has for the most part been accumulated within the last 5 years, and is so complete that the story of the origin, construction, and treatment of these neoplasms may now be told in a purely pragmatic and sequential way. As early as 1896 Von Recklinghausen observed, in addition to the ordinary fibromas, myomas, and fibromyomas of the uterus, certain muscle-tumors in which glands and cysts were present. The epithelium of the glands and cysts of these neoplasms, which he denominated "organoid myomas," he believed to be derived either from parental inclusion of fragments of the Wolffian bodies within the tissues of the coalescing tubes of Müller, or from cut-off postfetal outshoots of epithelium, growing from the uterine mucosa deep into the muscularis. Landau recalls that the tubes of Müller, which in the female become the Fallopian tubes, and by the blending of their lower extremities form the uterus and vagina, are so situated in the embryo that the upper segment of each tube lies laterally to the Wolffian body of the same side; also that at a lower point, which corresponds to the tubo-uterine junction of postfetal life, the tube of Müller crosses the Wolffian duct, coursing in a median ventral direction, and that the lowest or vaginal segment lies median to the duct of the Wolffian body.

¹ Jour. Am. Med. Assoc., Sept. 30, 1899.

With these relations in mind it is not difficult to understand how, as Von Recklinghausen has shown, fetal inclusion of epithelium from the Wolffian ducts within the substance of the uterine extremity of the Fallopian tube, or the muscularis uteri, could come to pass. The first substantial proof of Von Recklinghausen's theory is to be found in the fact that these tumors occur with overwhelming frequency in the peripheral layers of the uterine muscularis near the tubo-uterine junction, and are very often bilaterally symmetric. The second and most remarkable proof consists in the fact that the gland tubules of the adenomyomas under discussion, both in systematic anastomosis and character of epithelium, are strikingly similar to the Wolffian canals. In these tumors there may be traced out the systems of winding, secreting tubules with dilated extremities emptying into a straight connecting tubule or main canal, comb-fashion, like miniature parovaria. In other words, we see in a neoplasm of adult life the complicated anatomic structure of an elaborate embryonic organ. Landau has always sought for epithelial inclusions whenever a myoma presented which had entangled itself in the uterine muscularis, displaying no distinct line of demarcation, and each time with a positive result. Contrary to Von Recklinghausen, he states that adenomas which grow out from the uterine mucosa after birth may arise from the entire mucosa corporis or from a small circumscribed area, and may grow centrifugally through the uterine wall to the serosa, and even into the pars uterina tubæ and ligamentum latum. He has shown, moreover, on the basis of L. Pick's observation, that not all of these included epithelial outshoots from the mucous membrane represent post-fetal inclusions, but that some are developed from the epithelium and connective tissue which grow deep into the muscularis—peripheral layers—in fetal life. Pick has found glands of the fetal endometrium corporis occupying the subserous layer of the myometrium in adults, and has demonstrated that myomatous proliferation may take place about such displaced fragments of mucous membrane and remains of the tubes of Müller. He has shown that mucous membrane adenomas exist, which are primarily of fetal origin. It is well known that the stroma of the normal mucosa corporis uteri is made up of the so-called cytogenic tissue. In other words, it is a connective tissue composed of abundant round and spindle cells and intercellular substance containing fine reticulating fibers. This tissue is not found in the Wolffian body nor in its postfetal remains, neither in the epi-ovarium nor parovarium. It is likewise absent in parovarian adenomas showing the scattered arrangement and which have not attained considerable growth. If, however, the Wolffian tubules proliferate extensively, developing many adenomatous systems,—closed arrangement,—there then appears an accompanying growth of cytogenic connective tissue. The appearance, therefore, of cytogenic tissue in adenomyomas as the stroma of Wolffian body epithelium is not dependent on the localization of the neoplasm, but on the extent and intensity of the growth; but if epithelium-lined tubules are found anywhere in the female genital apparatus where such structures do not histologically belong, the presence of cytogenic connective tissue

as their supporting substance gives evidence of their origin from the tube of Müller or from the mucosa corporis uteri. Landau very appropriately calls attention to the great practical importance of a knowledge of the origin of these neoplasms. He believes that juxtauterine adenomas, and even voluminous subserous uterine adenomas, despite the diffuse transition of their bases into the normal muscularis, may often be treated successfully by conservative myomectomy. Pick and Landau have, moreover, encountered adenomas in the round ligament and in the posterior fornix of the vagina. Adenomas of the round ligament are hard, varying in bulk from the size of a walnut to that of a plum. They are not sharply defined from the surrounding tissues. In all cases of adenomyomas of the vagina the neoplasms are situated in the muscularis of the posterior fornix. They project as knotty masses into the perivaginal cellular tissue or protrude, polypus-like, into the vagina. In macroscopic section the fiber bundles are distinct, as in ordinary fibroids. Here and there are scattered yellowish and brown spots of pigment and irregular splits and cracks. On microscopic examination the supporting structure is seen to be composed of atypical fibromyomatous tissue. The little pigmented spots are seen to be gland- and cyst-formations presenting cylindric and ciliated epithelium. The adenomyomas of the ligamentum rotundum and posterior fornix offer valuable evidence in substantiation of Von Recklinghausen's theory of the origin of such neoplasms from displaced tubules of the Wolffian bodies. As in the male the epididymis is transported during the "descensus testiculorum" through the gubernaculum Hunteri, so in the female the cord of the primordial kidney in descending may draw a portion of this embryonic organ down with it into the inguinal canal. The Wolffian tubes, particularly of the distal parovarian segment, may thus descend into the canal of Nuck or into the labia majora. The transportation of epithelium from the primordial kidney through the ligamentum teres uteri to the inguinal region may be assumed without misgivings. Even Kossman, who denies the parovarian origin of uterine and tubal adenomyomas, concedes that the epithelium of adenomyomas of the round ligament comes to this region along the route indicated. If the Wolffian body is abnormally long and extends down over the dorsum of the sinus urogenitalis, or the canals at its lower pole persist until the tubes of Müller blend at the sinus, the parovarian segment of the Wolffian body could easily be swallowed up in the dorsum of the uterus or vaginal fornix. The adenomyomas of the posterior fornix present further evidence of their primordial-kidney source in the dichotomous branching of their tubules. In the case of those adenomas originating from the epoophoron we have to deal not with hypothetic Wolffian canals, but with physiologically preserved masses of primordial kidney. To the adenomyomas derived from the Wolffian body L. Pick has given the name "mesonephritic adenomyomas," and to those derived from the mucous membrane the name of "mucous membrane adenomas." The adenomyomas of the female sexual apparatus, therefore, belong to one or the other of these groups, and must not be confused with the ordinary histoid myomas

which represent simple circumscribed outgrowths from the muscularis uteri, and which, according to Virchow, are the result of irritative or inflammatory processes, and are not developed in any way from displaced epithelium.

Mortality from Fibroids.—F. H. Champnes,¹ in discussing the natural history of uterine fibroids, says that the mortality is to be considered from two standpoints: first, those which are not operated upon, and, secondly, those which are. The medical postmortem notes of St. Bartholomew's Hospital from 1867 to 1899 show that examination was made of the bodies of 1398 women of 30 years of age or over. Uterine fibroids were noticed in 74 cases, or just over 5%. A study of these records shows that the mortality of the 74 cases, apart from operation, was only 4.05%. In only 3 of the 74 cases could death be attributed directly to the uterine tumor. [In estimating the value of these figures the indirect effects of these tumors must be taken into consideration; a patient worn out from pain and anemic from loss of blood grows more and more into such a condition that she may contract almost any disease she would not have contracted otherwise; and having contracted it, is unable to survive on account of the general condition of her health. These indirect results are far more serious than the direct ones in uterine fibromas.] The surgical postmortem examinations cover a period from 1885 to 1899, and state the results of the examination of the bodies of 462 women upward of 30 years of age. The number of fibroids noted in these was 67. In 15 of the cases death was due, directly or indirectly, to the fibroids. In the ward for diseases of women in the same hospital, out of 547 cases of uterine fibroids there were 29 deaths, all of which, with one exception, followed operation. The reporter remarks that the classification of a death after hysterectomy is a matter for debate, and must depend upon the practice of the surgeon. If he operates when life is not threatened, then a death is to be credited to the operation and not to the fibroid; if he operates only when life is threatened, then the death is to be attributed in large part to the fibroid. It is apparent, therefore, that the percentages of mortality after operation are not a true test, either of the skill of the operator or of the correctness of his practice. We can not compare the operation for ovarian and fibroid tumors; the former almost invariably are fatal, while the latter are rarely so. Whether an operation should be undertaken in uterine fibroids depends upon the conditions in each case. Those needs which urge operation in fibroids are pressure upon the kidneys, a long-continued and severe hemorrhage, and rapid growth. Mere size may or may not be an indication for operation. A cystic fibroid should be treated like an ovarian tumor and removed.

Treatment of Uterine Fibroids.—According to Shober,² the extract of the mammary glands of sheep will often be found very helpful in regulating menstrual symptoms, causing increased regularity, diminution in the flow and of the pain accompanying it, while the tumor or tumors gradually decrease in size. From 2 to 4 grains of the desiccated

¹ Lancet, Jan. 20, 1900.

² Med. News, Sept. 30, 1899.

gland are given several times a day (up to 12 grains a day) over a period of 2 months. A depressing action on the heart is not to be anticipated. [The results of this treatment are more than doubtful, and it must be considered as still in its experimental stage. The fact is patent that after a lengthy trial and much literature on the subject few (very few) men are continuing its use. Most of those who formerly used it quite extensively are now operating on the cases they formerly treated with the lymph and reported cured or relieved.] Grimsdale¹ says that the indications for operative interference of fibroid tumors might be divided into *relative* and *absolute*. The relative indications comprise all the various well-known symptoms, including the mere presence of a tumor. The absolute indications covered all possible accidents which might happen calling for immediate operation. Of these, he had met with the following complications: Tumors obstructing delivery; torsion of the pedicle of a subperitoneal tumor, causing acute peritonitis; suppurating fibroid tumors, which might result sometimes from thrombosis of the vessels; and ascites from chronic peritonitis, especially associated with calcifying tumors. The relative indications might be divided into vaginal and abdominal. Among these there might be: (1) Rapid growth of the tumor, due sometimes to cystic degeneration; (2) pain due to pressure, and often to accompanying disease of the appendix; (3) size and weight incapacitating a patient; (4) pressure-symptoms, especially on the bladder, rectum, or ureters; (5) severe hemorrhage; (6) fetid discharge, which usually indicates a tumor protruding into the vagina. With respect to the choice of route, generally speaking, vaginal symptoms require the vaginal route, while abdominal symptoms indicate the selection of the abdominal route. The combined method is often a confession of failure to complete the operation undertaken in the first place. The mortality after either abdominal or vaginal operation is mainly due to sepsis, and experience has seemed to show that it is easier to avoid infection from without by operating *per vaginam*, but now results of abdominal operation are so good that it might be considered as safe as the vaginal route. The avoidance of hernia and absence of scar in vaginal operations are not factors of great importance.

Subperitoneal Hysterectomy.—Jaboulay² describes the following method: The usual median incision is carried as low as the symphysis, but without opening the peritoneum. The latter is then pushed upward at the side of the bladder until the broad ligament is reached, when the ureter and uterine artery will be seen, the latter being ligated. Lifting the peritoneum still higher, the anastomosis between the uterine and ovarian arteries is secured and the round ligament divided. The same procedure is followed on the opposite side. The bladder is separated from the uterus from below upward, and the cervix uteri is then freed from the vagina and drawn upward and forward. The tubes and ovaries are then detached, the peritoneal cavity is opened, and the uterus is removed. The small transverse opening in the peritoneum is sutured

¹ Brit. Med. Jour., April 7, 1900.

² Lyon méd., No. 37, 1899.

and the cavity of the wound is drained into the vagina. The writer has employed this method with success in several cases, and believes that it greatly diminishes the risk of sepsis, and prevents hemorrhage during the operation as well as facilitates the removal of diseased and adherent adnexa. [This procedure unnecessarily complicates the operation of hysterectomy and gives absolutely none of the advantages claimed for it.]

Ultimate Results of Castration for Fibromyoma.—Winternitz¹ quotes Säxinger's statistics, including 51 operations with 8 deaths; 39 patients were kept under observation during periods varying from 3 to 16 years; of these, both ovaries had been entirely removed in all but 3. In 88.8% the hemorrhages entirely ceased; in 83.3% the tumor certainly diminished in size. In 3 cases only did it continue to enlarge—twice on account of sarcomatous, and once from cystic, degeneration. In spite of these favorable results, the writer thinks that castration can not be compared with the radical operation, the mortality of the latter being as low as 2% in some hands. The palliative operation should, accordingly, be reserved for a limited class of cases in which, on account of the condition of the patient or the anatomic conditions, removal of the uterus would be attended with too great risk. [Not only does the loss of 8 cases following this operation condemn it, when compared to the results of hysterectomy, but the risk shown by leaving 2 sarcomas (mistaken for fibroma—an easily made mistake) should condemn the procedure at all times as a routine operation.]

Ultimate Results of Myomectomy.—Abel² presents a complete record of the abdominal sections for uterine fibromyomas performed by Zweifel from 1887 to 1894. He repeatedly examined 7 patients during a period of 5 years, so that he was able to state their exact condition. Many interesting facts were brought out, among them the behavior of the stump after supravaginal amputation (according to Zweifel's method). Contrary to the opinion of those who advocate total extirpation, in only 9 cases did suppuration occur, the patient making a good recovery and presenting no local complications in subsequent examinations. Vesical symptoms were less marked than after hysterectomy. The patients were all able to perform their usual work within 3 months after operation. The question of vaginitis and contraction of the vagina after supravaginal amputation was carefully studied; the former appeared to be due to mechanical causes (difficult coitus) rather than to an irritating discharge from the cervical canal. The danger of malignant degeneration of the cervix seems to be so small as to furnish no argument against the operation. According to the writer's observation, it undergoes progressive atrophy. A careful study of the cases in which the ovaries were left after removal of the uterus led to the inference that the glands undergo a more or less rapid atrophy, which results in complete loss of their functions before the natural time of the climacteric. Glaenecke's statement that atrophy of the external genitals is delayed when the ovaries are preserved was not borne out by the more extended observations of the

¹ Berl. klin. Woch., No. 36, 1898.

² Arch. f. Gynäk., Bd. LVII, Heft 2, 1899.

writer. On the other hand, the phenomena observed resembled the normal rather than the artificial climacteric noted after castration of young women. The average persistence of the menstrual molimen when the uterus alone was removed was 18 months. The patients whose ovaries were not removed presented the interesting phenomena of more or less regular menstruation after supravaginal amputation, persisting in one instance for 5 years. The writer concludes that it is better to preserve the ovaries whenever it is possible.

MALIGNANT DISEASE OF THE UTERUS.

Carcinoma of the Uterus.—T. A. Ashby¹ emphasizes the fact that carcinoma of the uterus is a very insidious disease, and may reach an advanced stage before its symptoms are recognized. The early symptoms simulate functional disturbances of menstruation. Any hemorrhage during or subsequent to the climacteric or any foul discharge should be promptly investigated, and all uterine troubles not responding to judicious local treatment or lesions about the cervix should arouse suspicion. Physical signs alone can not be relied upon in the early stages, and, when in doubt, it is important to make microscopic examination of curettings or of secretions excised from the uterus. W. Krusen² says that to aid in the early diagnosis of cancer of the uterus the following points may be of value, although all may not be applicable in every case: (1) The unusual friability and vascularity of the tissue, which, if not detected by the finger, may easily be made apparent by hooking a tenaculum into the suspected area. The tenaculum will immediately tear out and cause abundant bleeding from the carcinomatous tissue. (2) A close adhesion of the mucous membrane of the portio to the parenchyma. (3) The difficulty in cervical dilation, as evidenced by the introduction of a tent. In a cancerous process there is, as a rule, a continuance of the hardness after dilation. (4) Bleeding is easily provoked by an examination or by an unusual exertion or manipulation. (5) The characteristic induration of the cervix is almost imperceptible at first, but increases as the disease progresses. (6) Puncture of any suspected nodules or follicles will differentiate carcinoma from cystic follicles or distended glands. (7) Ulcerated or eroded areas which are not speedily amenable to treatment should be regarded with suspicion. (8) Any enlargement of the uterus occurring after the menopause is usually due to malignant disease. (9) An early diagnosis can be made with absolute certainty only by microscopic examination either of an excised wedge from the suspected cervix or, in cancer of the body, of portions of the endometrium removed by curettage. The value of the examination will depend upon the experience and competency of the pathologist. T. S. Cullen³ states that there are 3 different kinds of mucous membrane in the uterus: viz., (1) that of the vaginal portion; (2) that of the cervix; (3) that of the body; and hence there are 3

¹ Maryland Med. Jour., Sept. 23, 1899.

² Pacific Med. Jour., Dec., 1899.

³ Med. Rec., Dec. 9, 1899.

definite varieties of carcinoma, and only 3, in the uterus. There is no difficulty in making a diagnosis of carcinoma of the various portions by an examination of the scrapings. The presence of glands at a considerable distance from the mucosa is not, as had been supposed by some, an indication of malignancy. An idea that has gained quite general acceptance is that the mucous membrane of the uterus is shed at each menstrual period, but some recent studies have shown that such is not the case. The glands in the body of the uterus take no part whatever in squamous carcinoma of the cervix. Rarely in cancer of the cervix is there an extension to the lymphatic glands. The cells in cancer of the cervix are usually rather large and the lymph-radicles somewhat small. In the breast, on the other hand, there are small epithelial cells and large lymph-channels. It is probable that the growth must extend far out into the broad ligament before extension into the lymphatic glands can take place. In one case, in which there was a squamous carcinoma of the cervix associated with pregnancy, the woman had been kept under observation until term, and then both uterus and child were removed. The child had lived 4 or 5 months, and had then succumbed to some intercurrent trouble. The mother was still alive and well, though the operation had been performed 2 years before. A very curious and interesting feature of the case had been the presence of a normal decidua formed on the lip of the external os, as well as in the uterus. In one case, in which a diagnosis of malignancy had been made from an examination of the scrapings, after removal of the uterus it had been impossible even for an expert to distinguish, from the external appearance, between this and the normal uterus. However, on cutting open the uterus a malignant growth had been found. In such a case diagnosis without microscopic examination would have been impossible. The glandular growth of the cervix was the most malignant type of carcinoma found in the uterus. True erosion of the cervix is characterized by loss of substance and disappearance of the epithelium, but a large number of so-called erosions are nothing more than eversions of the normal mucous membrane. As the blood-vessels in this portion of the mucous membrane are covered only with a layer of epithelium, the surface appears red. When such a surface is treated, as in the old days, by repeated applications of iodine, the result is a thickening of the epithelial covering and an appearance resembling healing of the surface, so that it looks like the outer portion of the cervix. This has led the physician to suppose that the "erosion" has been healed; but in a few weeks the thickened epithelium will be exfoliated, the blood-vessels will once more show through the thin epithelium, and the physician is then led to believe that the "erosion" has returned. Occasionally, the hardening and dilating of the glands of the cervix will give an appearance suspiciously like carcinoma. In cases of adenocarcinoma of the body of the uterus it is impossible to say definitely, by palpation, that malignant disease is present; indeed, such might be the case and still the uterus be diminished rather than increased in size. In this class of cases one must depend upon microscopic examination for a diagnosis. In all cases in which the

patient is between 30 and 60 years of age, and there are hemorrhages, and the diagnosis is not clear, the uterus should be curetted or a portion of the cervix removed. The diagnosis of malignancy having been made, no time should be lost in removing the entire uterus. It should not be forgotten that in securing the scrapings the curet must be systematically applied to the whole interior of the organ, otherwise the diseased portion might be passed by.

Pathology of Carcinoma of the Uterus.—D'Erchia¹ calls attention to certain tissue changes in the uterus and adnexa in connection with cancer. Hypertrophy and hyperplasia of the uterine mucous membrane and connective tissue are frequently noticed, and occasionally sarcomatous degeneration of the connective tissue of the cervix. Extensive hyaline degeneration of the stroma and vessel-walls of the ovaries is common, and in one instance a small metastatic nodule was found in the middle third of one tube. The practical deduction made by the writer is that the adnexa should always be extirpated with the uterus even in the early stages of cancer of the uterus. Kaufmann,² from microscopic studies of a cancerous cervix removed 5 years after supravaginal amputation of a fibroid uterus, arrives at the conclusion that **malignant adenoma**, especially of the cervix, represents a distinct variety of cylindric carcinoma, with a tendency to the formation of more or less perfect glands. The malignant character of the growth is shown by the polymorphism of the gland-epithelium as well as the disposition to the formation of numerous layers. So-called inoculation—metastasis in the vagina—usually represents direct extension of the disease. True metastasis by way of the lymph-vessels or blood-vessels is more probable than the development of separate foci by inoculation. It can not be denied, however, that raw surfaces may be inoculated during operation.

The Coexistence of Fibromyoma and Carcinoma in the Uterus.—W. Wayne Babcock, Jr.,³ reports 3 cases of associated fibroma and carcinoma of the uterus, from which he draws the following conclusions: (1) That the frequency of association of fibromyoma with adenocarcinoma of the corpus uteri is greater than would be *a priori* expected, and relatively greater than with the more common epithelioma of the cervix; (2) that a coincidence of the two growths is favored by their individual proneness to affect the nulliparous, but that the frequency of association seems greater than is thus explained, or than is explained by the frequency of fibromyomas in all uteri after middle life; (3) that the endometrial hyperplasia and congestive and irritative influences produced by fibromyomas would seem to favor the development of the malignant tumor; (4) that further investigation is desirable before the old theory that fibroids predispose to cancers in the uterus is considered as disproved; (5) that the occasional serious errors of diagnosis from this association render the routine examination of the endometrium desirable in elderly women with fibroids, and imperative when there is excessive discharge or overdischarge, or abundance of scrapings.

¹ Zeit. f. Geburtsh. u. Gynäk., Bd. XXXVIII, 1899, Heft 3.

² Virchow's Archiv, Bd. CLIV, Heft 1, 1899.

³ Jour. Alumni Assoc. College of Physicians and Surgeons, Baltimore, July, 1899.

The Medicinal Treatment of Uterine Cancer.—Thomas More Madden¹ refers to celandine, or swallowwort, as a very old remedy which has been again recently reintroduced into practice in the treatment of cancer cases, and says that it was employed in some cases of malignant disease of the uterus in his wards. In 3 of these, in which the celandine extract was locally applied and administered internally, the condition of the cancerous ulceration was rapidly and distinctly improved for a time; in 2 no change was produced; but in none of them was any permanent curative effect produced. The local injections of absolute alcohol, as recommended by Schultz, were employed in some of his inoperable cases of cervical cancer. In one of these the first injection of alcohol was followed by such local pain and constitutional disturbance as to prevent its repetition. In two other cases similar but deeper parenchymatous injections, repeated at intervals of 2 or 3 days, were attended with some diminution in the amount and fetor of the discharge, and in an apparent shrinkage in the diseased structure. In neither of these cases, however, did the patient remain sufficiently long under observation to warrant any conclusion as to the probable duration of these effects. Several years ago Madden called attention to the value of methylene-blue as a local analgesic in pruritus and other gynecologic cases, and since then he has frequently employed it in this way and to relieve the pain of uterine cancer. In cases of inoperable cervical carcinoma a pledget of sterilized gauze saturated in a 5% solution of methylene-blue will occasionally not only allay pain, but also cleanse and temporarily improve the condition of the parts, while the injection of a similar solution by the needle into the substance of a medullary growth may for a time cause some diminution of its size and abatement in the amount and fetor of the discharge.

Gessner² states that the three **symptoms to be relieved** are hemorrhage, offensive discharge, and pain; the two former may be checked by judicious operative interference. Narcosis is advisable, for the moral effect as well as for the purpose of doing thorough work. The technic is, briefly, disinfection of the field of operation, thorough curetment with a sharp spoon, deep cauterization, and tamponade with iodoform gauze after the application of boro-tannin. The tampon is removed in 5 or 6 days, and after separation of the slough strong tincture of iodine is applied. Zinc chlorid is more or less dangerous, since its action can not be controlled. Chlorid of iron, pure carbolic acid, and other similar caustics produce no permanent effect, and must be used repeatedly. Injections of alcohol, pyoktanin, etc., are painful and uncertain. The flap operations of Martin, Chrobak, and others are of limited application. If no operation is possible, the best local treatment is the application of dry disinfectant and astringent powders. Potassium permanganate (1:1000) is the best solution for vaginal injections, hydrogen dioxid and thymol being also recommended. Narcotics should be used sparingly at first, the coal-tar derivatives being tried before opium. J. Parsons³ remarks

¹ Brit. Med. Jour., Oct. 14, 1899.

² Centralbl. f. Gynäk., No. 29, 1899.

³ Brit. Med. Jour., April 28, 1900.

that Sanfelice's discovery of a **definite parasite** opened up a possibility of treating the disease through the medium of the circulation, eradicating it entirely. The investigations of Pasteur, made more than 20 years ago, showed that the *saccharomycetes* could obtain everything required for their nourishment in the human body, while Schutzenberger had demonstrated that they could extract oxygen from the red corpuscles through a thin membrane. The human body, therefore, is quite a suitable habitation for these fungi, except that their main food—sugar—can be obtained only in small quantities. This serves to explain the slow growth of the parasites as compared with their rapid growth in fermentation with abundance of sugar. He thinks that the two methods of propagation, by budding and by sporing, will explain the great variations observed in the periods of recurrence, because when spores are formed, they might remain quiescent for years before commencing active growth. The rapidity of growth in cancer of the liver and in stout persons can be explained, for the liver is the storehouse for sugar, and in stout persons there is often an excess in the circulation, which might even be found in the urine. We can now understand why the disease is more prevalent in the water-sheds and along the courses of rivers, because the *saccharomycetes* flourish in moisture and damp atmosphere. Judging from Pasteur's work, there is no toxin formed by the yeast. This will account for the clinical symptoms of cancer being different from the microbic group of diseases; in fact, he considers that Sanfelice's statement explains nearly everything in connection with the disease, and is probably correct. He indicates the lines on which treatment might be successful. Various bacilli are hostile to these fungi, and some toxin might be found which will kill them without doing harm to the cells of the body. Various drugs and salts destroy these *saccharomycetes*, and a selection of those that might safely be administered can be tried. As phagocytosis does not take place, further knowledge may show how to induce it. An antidiabetic diet, so as to reduce the sugar as much as possible, is worth trying.

Operative Treatment of Carcinoma.—Gottschalk¹ commends the following method of treating inoperable cancer of the cervix: after thorough cauterization of the ulcerated cervix, a circular incision is made with the Paquelin cautery in healthy vaginal tissue, and the cuff thus formed is turned downward over the diseased area and kept in contact with it by a gauze tampon, which is left *in situ* for a week. A cicatrix results, which occludes the vagina transversely and resists the invasion of the disease for 5 or 6 months, during which time the patient remains free from hemorrhage and foul discharge.

H. A. Kelly² says that we can not reason too closely on the **supposed analogy between cancer of the uterus and cancer of the breast**. Glandular metastasis, which plays so important a rôle in mammary cancer, has very little to do with the extension of the disease in uterine cancer. The latter progresses through the tissues from its cervical focus. The aim of the operation is to give the diseased cervix

¹ Centralbl. f. Gynäk., No. 3, 1899.

² Johns Hopkins Hosp. Bull., Mar., 1900.

the widest possible berth instead of removing the uterus and the pelvic glands. The frequent recurrence in the vaginal vault emphasizes the importance of beginning enucleation at a point as distant as possible from the junction of the vagina with the cervix. In every case the ureter should be catheterized, which can be readily done by putting the patient in the knee-chest position. After the catheter is in position the patient is again placed on her back. If this preliminary catheterization is not performed, the operator must enucleate the cervix, for fear of including the ureters in the ligatures. After curetting the diseased cervix he cuts through the vagina on all sides and strips it loose from the bladder, so as to expose the vesico-uterine peritoneum. The opening is then made posteriorly into the recto-uterine pouch, which frees the uterus from all its attachments except its broad ligaments. A gauze pack is then put into the pelvis above the uterus, while the anterior uterine wall is caught with the forceps and drawn through the anterior incision until the fundus is inverted. The uterus is then divided from above downward. One-half of the uterus is then grasped by the forceps—one being placed on the body and one upon the cervix; an incision is then made transversely above the cervix, dividing each half into two portions, the uterine vessels are clamped, and the body of the uterus removed. After the removal of the body of the uterus on both sides the cervix is taken out, beginning on the side of the cervix which is least implicated. After three-fourths of the uterus have been removed the most important step of the operation is reached, namely, the removal of one-half of the involved cervix with the infiltration of the broad ligaments; the extirpation of the greater portion of the uterus affords a maximum space for the operator. The diseased portion of the cervix held in the forceps is to be excised by the widest possible incision. A ligature in some cases can be employed, but hemorrhage is best controlled by the hemostatic forceps devised by Skene, of Brooklyn. If the ureter is outside of the diseased area, it may be left, but in some cases it is necessary to resect it and reattach it to the bladder.

Abdominal Hysterectomy.—Picque and Manclaire¹ believe that simple vaginal hysterectomy is not the most radical method of dealing with cancer of the uterus. In order to remove all the disease the operation not only must be undertaken as early as possible, but must be thorough, involving the removal of all the affected lymph-glands. This can be accomplished only by the abdominal route. The procedure is lengthy and not free from danger, on account of the proximity of large vessels. Preliminary ligation of the uterine arteries at their point of origin affords the best method of hemostasis. The operative mortality in the abdominal operation is 4 times as great as in vaginal hysterectomy. As regards the ultimate results, sufficient data have not yet been collected to speak positively. Moreover, the technic has not been perfected. It must be remembered that the thorough removal of carcinomatous foci from the pelvis is a far different procedure from the dissection of the axilla or the neck; but if the more dangerous operation increases

¹ Ann. de gynec. et d'obst., June, 1899.

the chance of the radical cure, the surgeon should not hesitate to perform it in every suitable case of uterine cancer.

Vaginal Hysterectomy.—Terrier¹ draws a gloomy picture of this operation, as far as immunity from recurrence is concerned. If the cancerous uterus is to be removed, the abdominal is better than the vaginal method. Out of 9 abdominal hysterectomies by Terrier, 6 recovered and 3 died. He admits that astonishingly good temporary results follow hysterectomies when the disease is so far advanced that recurrence must be almost immediate. He himself has not only removed the uterus, but also resected the vagina, dissected away pelvic glands, and cleared away all that was suspicious—complicated operative manœuvres practicable only through the abdomen. Great temporary relief ensued, but early recurrence invariably occurred. He has never succeeded in curing his patient thoroughly, however extensively he was able to clear away suspicious tissue. He feels certain that the alleged permanent cures reported by others were errors of diagnosis, clinical and pathologic. [These conclusions coincide with those presented at the last meeting of the American Medical Association, when it was virtually decided that recurrence is bound to follow sooner or later in every case of true cervical carcinoma operated upon.] Jessett² reports the results of vaginal hysterectomy for carcinoma of the uterus in 107 cases operated on during 7 years. Of the patients, 9 died from the operation—3 from shock, 2 from intestinal obstruction, and 4 from peritonitis. Of the whole number, 4 were operated upon in 1892, 17 in 1893, 22 in 1894, 16 in 1895, 18 in 1896, 18 in 1897, and 12 in 1898. Of the 4 patients operated on in 1892, 1 is known to be well; 1 died within a year from recurrence; 1 had an early recurrence; and 1 was lost sight of. Of the 17 patients operated on in 1893, 1 died from septic peritonitis and 6 had recurrence and died within a year. Of these, 1 died within three months from a secondary growth at the pylorus, and 1 in 9 months after the operation from a secondary growth in the intestine. There was no local recurrence in either case. Three of the patients were lost sight of, but they were well 12 months after the operation, and the remaining 5 were free from recurrence 2 and 3 years after the operation. Of the 22 patients operated on in 1894, early recurrence took place in 5, and 3 died from the operation—1 from shock, 1 from intestinal obstruction, and 1 from peritonitis. One patient died 12 months after the operation from other causes, and there was no local recurrence. Seven patients were well in from 9 to 15 months after the operation, and the remaining 6 were well 2 years afterward, and, so far as is known, without recurrence. Of the 16 patients operated on in 1895, early recurrence took place in 5, in 2 within a year, in 2 within 2 years, and in 1 within 2½ years. The remainder were well when last seen, 4 of these quite recently. Of the 18 patients operated on in 1896, 2 died from septic peritonitis, recurrence took place in 5 within a year, and 1 died within a year from secondary glandular involvement, but without local recurrence; 2 patients were lost sight of, and the remainder were free from recurrence when last heard of. Of

¹ *Gaz. des Hôp.*, July 22, 1899.

² *Lancet*, Nov. 18, 1899.

the 18 patients operated on in 1897, 2 died—1 from intestinal obstruction and 1 from peritonitis. In 3, early recurrence took place; in 1, secondary deposits in the abdomen; 2 were lost sight of, and the remainder were free from recurrence when last seen. Of the 12 patients operated upon in 1898, 1 died. This was a case of combined abdominal and vaginal hysterectomy, the carcinomatous uterus being also the seat of several myomas. In 1 case immediate recurrence took place; on the remainder, it is yet too early to make any comment, although they are free from recurrence. Two of the cases were complicated by the presence of ovarian cysts, which were tapped through the vagina and their contents removed. Both patients recovered. In 5 cases myomas were present, in 4 instances necessitating the performance of the combined abdominal and vaginal operation. Of these, 2 died from shock. Myomas of smaller size were present in several other cases, and in these the diseased organ could be removed through the vagina. In 13 cases the seat of the disease was limited to the body of the uterus; in the remainder the disease commenced in the cervical canal or the enlarged os, and in many of these the mucous membrane of the vagina was more or less invaded.

Pryor¹ describes his method of performing the operation for carcinoma of the cervix: He makes the usual vaginal incision, except that the incisions do not join at their lateral extremities, but leaves a strip of mucous membrane $\frac{1}{8}$ of an inch wide intact between them. He then separates the uterus from its attachments anteriorly and posteriorly by the fingers, and further passes one finger up along the posterior cervix of the uterus in the median line as high as he can reach, separating the adhesions, however, over a tract no wider than the fingers; he then draws the uterus down with traction-forceps applied one at each side of the external os, and splits the anterior wall of the uterus as far as he can see; then attaching fresh traction-forceps to the upper angle of this portion, he draws the uterus down further, rolling out the cut and continuing the incision in the median line through the anterior wall until the fundus comes into view. He then passes a large grooved director up along the uterus posteriorly in the tract laid bare by the finger, and brings it into view in front of the fundus; he then slits the uterus with a knife on the director, so that it is separated into two lateral halves. A pair of traction-forceps is then fastened into the fundus of each segment and another pair into each side of the cervix. The right half of the uterus is then shoved high up into the pelvis, the left is drawn down, and the adhesion and the adnexa are freed until this half of the uterus and broad ligaments is wholly clear. This is then shoved far back into the pelvis. The right half is next drawn down and the process repeated, except that great care is taken to avoid injuring the appendix in case it should be adherent to the appendages on the right side. When the right half of the uterus and the appendages are thoroughly freed, the fundus of this side is drawn strongly downward and the ovarian artery is clasped with a pair of forceps slowly from above downward. The same process is repeated on the other side and the uterus is removed. The strips of mucous membrane

¹ Am. Jour. Obst., May, 1899.

left intact in the original incision prevent the broad ligaments from being torn during the annexing. The pelvis is then dried, inspected for hemorrhage, and packed with gauze.

AFFECTIONS OF THE PELVIC VISCERA.

Tumors Developing in the Abdominal Wall.—Olshausen,¹ at a recent meeting of the Gesellschaft für Geburtshilfe und Gynäkologie of Berlin, spoke regarding tumors developing in the abdominal wall, and especially of the fibroid variety. He has observed 22 such tumors during the last 12 years, 20 of which were removed by operation. All occurred in women who had borne children. It is his belief that there is a close relationship between these tumors and pregnancy and labor; and, furthermore, as shown by Virchow's investigation, they result from injury or tearing of the muscle-fibers in the posterior portion of the rectus muscles. The diagnosis is easily determined in the greater number of cases, but when the tumor is very large, it is often most difficult. They should be treated by operation, care being taken not to open the peritoneal cavity. Finally, he described 2 cases of very uncommon tumors of the abdominal wall—one a carcinoma which appeared 1½ years after an ovariectomy, and the other an ovarian tumor occurring 11 years after an ovariectomy. At the same meeting Pinkus demonstrated a fibroid tumor, the size of a fist, which he found embedded between the internal oblique and transversalis muscles. Fleischlen also described a case in which he removed 3 fibroid tumors from the abdominal wall. They originated in the posterior wall of the rectus muscle and from the aponeurosis of the left external oblique muscle. According to A. L. Stavely,² **sex is an important factor** in their production. Sufficient confirmatory statistics have been collected, substantiating this point. Ill says that 82% occur in women. In 38 cases collected by Gratzner, 33 occurred in women; Sanger reports 8 cases, all of which were in females; Guerrier refers to 44 records from the literature, and out of 35, where the sex was specified, only 3 were in men. In Stavely's list, which includes 100 cases, and which is in no way complete, 89 occurred in women, 16 in men, and in 5 the sex is not mentioned. The unusual preponderance of these growths in women has unquestionably a direct relation in many instances to pregnancy or labor. During advanced pregnancy or labor the abdominal walls are very prominent, and on that account more freely exposed to surgical insults, like kicks and blows, which are frequently associated with the primary development of sarcomas and also fibroids. In 23 cases in Stavely's table it was mentioned that the patients had either been pregnant about the time the tumors first were noticed, or in labor, or were mothers of several children. The great majority of the 100 were between 20 and 40 years of age; 15 were over 40, and of these, 9 had tumors presenting an appearance of malignancy; 4 were below 20 years. Age, then, seems to be a predisposing factor.

Torsion of the Fallopian Tubes.—Praeger³ collected 20 cases of

¹ Centralbl. f. Gynäk., No. 32, 1899.

² Phila. Med. Jour., Mar. 17, 1900.

³ Arch. f. Gynäk., Bd. LVIII, 1900, Heft 3.

torsion of the Fallopian tubes, to which he adds 2 which came under his own observation. He explains this relatively small number by the fact that the pedicle is rarely sufficiently long to allow it to become twisted. In order that this accident may occur it is also necessary that there should be a cyst or neoplasm of the tube, confined to the distal portion, and that no adhesion should be present. Torsion is accordingly most common in connection with hydrosalpinx. As regards the immediate causes of torsion, these are the same as in the case of ovarian tumors. Hemorrhage into the tube and sac result, as in ovarian cysts; the blood may escape into the peritoneal cavity. Necrosis, infection, and peritonitis occur secondarily. The clinical symptoms, prognosis, and treatment are practically the same as in ovarian tumors.

Supernumerary Fallopian Tubes.—A. C. Vieter¹ remarks that the special interest in the Fallopian tube lies in its outermost part, about the region of the outer third and the abdominal opening—the fimbriated extremity. (1) The most common variation here is the presence of more than one fimbriated extremity. The supernumerary openings, or ostia, may be one or more in number (1 to 3), and resemble the terminal ostium in being surrounded by fimbriae and by leading into the canal of the tube. (2) Another variation is the appearance of a bunch of fimbriae without an ostium, but growing from a pedicle which springs from the wall of the tube a varying distance from the fimbriated extremity. [Doran reports a modification of this (*a*) in which the pedicle had atrophied and the fimbriae appeared to lie loose in a fold of the broad ligament; and he reports a case (*b*) in which the fimbriae were attached to the pedicle of the hydatid of Morgagni, and a second case (*c*) where the hydatid of Morgagni had disappeared, and in its place was a bunch of fimbriae on a long pedicle.] (3) The third variation is the presence of a tubular prolongation projecting from the main tube, after the manner of a branch; this tube may be blind and may have fimbriae at its extremity and along its side. [Klob has called attention to a small example of this blind tube, amounting to little more than a slight bulging of the wall of the tube, which is thinned at the apex and situated near the root of the normal fimbriae. It seems quite possible to trace a relationship between these last two classes and to combine them into one, making the second class the presence of a secondary projection from the wall of the tube, this projection being impervious, like a pedicle, or ending in a blind extremity and containing a canal communicating with the canal of the tube; in either case the projection may have fimbriae attached to its extremity or along its side. Further, it now seems possible to trace a relationship between this second class and the first class, and to combine them into one. We would then say: The outer portion of the Fallopian tube may vary in the direction of supernumerary fimbriated extremities. These supernumerary extremities may be (*a*) exact counterparts of the normal fimbriated ostium; they may appear (*b*) as minute fimbriated openings in the side of the tube; (*c*) as groups of fimbriae attached to the side of the tube without any opening; (*d*) as

¹ Boston M. and S. Jour., May 17, 1900.

groups of fimbriæ attached to a tubular prolongation of the wall of the tube, this accessory tube opening into the cavity of the main tube, but not into the peritoneal cavity; (e) as groups of fimbriæ attached to a solid prolongation of the wall of the tube without any opening into the cavity of the tube or into the peritoneal cavity; and, finally, (f) as groups of fimbriæ which may be attached to, or may take the place of, the hydatid of Morgagni.]

Appendicitis and Salpingitis.—Rontier,¹ in reporting a series of cases, emphasizes the difficulty in making a diagnosis between these two conditions, since there are no pathognomonic symptoms. When the two exist, it is not easy to determine whether the inflammatory process began in the appendix or in the tube. Since unilateral disease of the tube is rare, however, it is safe to infer that a tumor upon the right side is appendiceal. Moreover, when during the course of a celiotomy the right tube alone is found to be diseased, the appendix should always be examined and removed if it presents a suspicious appearance. A. J. Ochsner² says that the following conclusions seem to be borne out by his experience: (1) Appendicitis frequently causes inflammatory diseases of the right ovary and tube, and occasionally the left side is also involved. (2) This condition is especially likely to give rise to chronic invalidism, because of the periodic exacerbation resulting from the congestion due to menstruation. (3) In operating for the relief of pyosalpinx, the condition of the appendix should always be determined. (4) In operating for chronic or recurrent appendicitis in patients suffering also from dysmenorrhea, the right ovary and tube should be examined. (5) If the pain is limited to the right side in severe dysmenorrhea, the appendix is frequently primarily involved. (6) In catarrhal appendicitis in which there is a fecal concretion in the appendix, or in appendicitis obliterans, the pain is frequently most severe during menstruation. (7) In patients who have recovered from gangrenous appendicitis there is frequently no further disturbance from the condition of the appendix, except the digestive disturbance due to adhesions, while the secondary disturbance in the ovary and Fallopian tube may continue to be very great. (8) In young girls suffering from dysmenorrhea the history should be followed very carefully, in order to determine the occurrence of a previous attack of appendicitis. (9) The fact that many of these cases are mistaken for salpingitis accounts for the theory that appendicitis is more common in men than in women.

Peritoneal Adhesions.—Gersuny³ describes a case in which an adhesion was found at the beginning of the sigmoid flexure, extending across the outer layer of the mesocolon. It was not recognized until the colon was drawn toward the median line. The clinical symptoms were constant pain in the lower part of the abdomen, violent pains in the left side before defecation, chronic constipation and tenderness over the appendiceal region, as well as at a corresponding point on the left side. The writer states that he has operated upon 21 cases of a similar

¹ Ann. de Gynec. et d'Obst., No. 12, 1898. ² Jour. Med. Assoc., July 22, 1900.

³ Arch. f. klin. Chir., Bd. LIX, Heft 1, 1900.

character, and believes that adhesions at the sigmoid flexure are not rare, but are readily overlooked because they are often complicated by appendicitis and pelvic disease. Hemorrhages into the peritoneal cavity are doubtless responsible for the formation of adhesions. Such hemorrhages may be due to injuries or to the rupture of Graafian follicles and the escape of blood from the tubes. Possibly some cases of appendicitis may be secondary to adhesions thus produced. The treatment is surgical—abdominal section and separation of the pseudomembranes. A. L. Beahan¹ remarks that the location of intra-abdominal adhesions is of interest as regards their effects. When located below, in the region of the appendix, or the appendages, of themselves they cause less pain than when located above, because of the action of the diaphragm in the act of respiration on the abdominal contents and any coexisting adhesions. The form of adhesions may be flat, velamentous, or band-like. They may agglutinate parts or suspend structures or encircle organs. The omentum with its ramifications of vessels and nerves has a function all its own in its intricate method of conserving nature by shutting off foci of danger and forming barrier adhesions. This function is illustrated when the omentum passes as an enveloping apron into the appendicidal region and in a mothering way covers in the filth-deposit of an involved appendix. For some peculiar reasons no abdominal lesion or disease has so strongly fortified a barrier thrown up in its defense.

Abdominal Section.—1. *Asepsis and Antisepsis.*—Harris,² after an exhaustive bacteriologic study of the preparation of the abdomen for operation, made in the Gynecologic Department of the Johns Hopkins Hospital, draws the following conclusions: (1) It is impossible to sterilize the living skin. (2) Efforts at sterilizing even the superficial parts of the skin by methods used in the operating room are unsuccessful in most cases [and probably so in all cases]. (3) The degree of sterilization of the cuticular layer of the abdominal skin achieved by preparation for abdominal section varies directly with the amount of cleansing done. Sarway³ conducted a series of investigations to determine how thoroughly the skin of the surgeon's hands can be disinfected without the employment of antiseptics other than alcohol. He notes first that cultures can always be obtained from hands which have not been carefully prepared, and the number of germs that can be grown is increased by moistening such hands with sterile water. Moreover, the number is increased by 5 minutes' vigorous washing with sterile water, sterile soap, and a sterile brush. If, however, after this vigorous washing the hands are again washed for 5 minutes in 96% alcohol with a sterile brush and sterile cloths, the number of germs is slightly lessened. A 10-minutes' washing of the hands in hot water (42° C.) also diminishes the number of germs.

2. *Technic.*—H. A. Kelly⁴ emphasizes the importance of the exploration of the abdomen as an adjunct to every abdominal section. The following diseases are most likely to be found in such a routine

¹ Ann. of Gyn. and Ped., Feb., 1900.

² Centralbl. f. Gynäk., No. 41, 1899.

³ Pacific Med. Jour., Dec., 1899.

⁴ Med. News, Dec. 16, 1899.

examination: appendicitis, hernia, either inguinal, femoral, or umbilical, hydro-ureter, disease of the omentum, pyloric cancer, movable kidney, enteroptosis, cancer of the liver, perihepatitis, gall-stones. There are 4 steps in the exploration of the abdomen. First, the simple inspection



Fig. 70.—Method of exploring the abdominal viscera (H. A. Kelly, in *Med. News*, Dec. 16, 1899).

of such structures as can be seen in the neighborhood of the incision by drawing the lips of the incision widely apart; second, the examination of those structures which can be brought into view by inserting two fingers through a small incision and catching structures near by, such as ovaries, tubes, cecum, and appendix, as well as the uterus; third, by the insertion of the hand, as far as the wrist, by which the colon and the stomach and the pylorus can be grasped and palpated or pulled down (Fig. 70); and, fourth, by the insertion of the forearm in order to reach the liver, the gall-bladder, the kidneys, and the spleen. In making this exploration extreme care must be taken to maintain asepsis by thoroughly sterilizing the arm or by wearing a rubber glove with a long sleeve

reaching as far as the elbow. (Fig. 71.) The length of incision necessary for a complete exploration of the abdomen must vary from 10 cm. or 12 cm. up to 15 cm. (6 to 9 inches); it must be so large that there will be no risk of bruising the tissues by forcing in the arm through a tight opening.

J. B. Murphy,¹ in speaking of the use of irrigating fluids in the abdominal cavity, says that the purpose of irrigation is, first, to remove foreign material from the abdominal cavity; second, to dilute the poisons in this cavity; third, to prevent adhesions; and, fourth, to prevent or stop



Fig. 71.—Rubber gantlet (H. A. Kelly, in *Med. News*, Dec. 16, 1899).

shock. For the fourth division, irrigation is of little value. We have now at our disposal a much more effective means: namely, **intravenous saline injections**. In certain types of peritoneal infection, by irrigating the peritoneal cavity and filling it with the saline solution he believes that the poison may be so diluted as to tide the patient over the

¹ *Pacific Med. Jour.*, June, 1900.

immediate intoxication, and perhaps resist subsequent infection. The primary purpose of abdominal irrigation is the removal of aseptic materials from the abdomen, postoperative: that is, blood, fragments of tissue, cyst-contents, serum, etc. Blood-clots, he believes, can be removed with a dry aseptic sponge better than by irrigating fluids. Infection of the peritoneum occurs from 3 sources: least of all, if at all, from the air (with a very large interrogation point); principally and primarily from the surgeon's hands; and, thirdly, from the skin of the patient. If infection has been carried from any one of these sources, he believes irrigation will do no good. If surgeons would consider the peritoneum as a broad surface in pathology and in operation, the same as they do the surface of the skin, where all the pathologic changes that take place can be observed, he believes that they would rapidly come to operate in the peritoneal cavity, the same as they do outside of it, without any irrigating fluids or antiseptic solutions. Eichel¹ adopts the following plan of **gradually introducing saline solution** into the peritoneal cavity after severe operations: Before closing the wound a No. 18 catheter is inserted at the lower angle and carried down into Douglas' pouch. The wound is sutured in the usual manner, and the catheter is cut off and its end secured with a wire suture and attached to a glass irrigator. After the dressings have been applied a continuous flow of saline solution is begun and is maintained for 24 hours at the rate of 1 cc. a minute. This is effected by compressing the supply-tube with a clamp fitted with a millimeter screw. About 3 pints of fluid are introduced in 24 hours.

[Last year Ruggi recommended **resection of the plexus spermaticus or utero-ovarialis to relieve pain**, or as a supplementary measure in laparotomies, even claiming that in many cases of hyperesthesia and erethism this intervention might alone answer the entire purpose.] Cavazzani² now reports 2 cases thus treated: one had had one ovary removed, and later a hysterosalpingo-oophorectomy on the other side had been done, but intense pains still persisted in the right iliac fossa, radiating to the foot on that side and to the thorax and shoulder on the other. The tube was found degenerated and there was a serofibrinous exudate in the small pelvis. The ovarian plexus was resected and all pains disappeared as if by magic—not a twinge occurring since the evening of the operation. The effect of suggestion was excluded, as the patient had not been informed that any unusual operation was to be performed, and was very deaf. In the other case the pains persisted after vaginal hysterectomy, radiating from the iliac fossa to the hip and thorax, and preventing all work. An atrophied tube and ovary on the opposite side were removed and the ovarian plexus was resected. The pains disappeared completely.

Experiments upon the Closure of the Fallopian Tubes.—Fränkel³ gives the results of experiments conducted with a view to determining an efficient method for closing the lumen of the Fallopian tubes. He ligated the tubes at various points with catgut and silk of

¹ Arch. f. klin. Chir., Bd. LVIII, Heft 1, 1900.

² Gaz. degli Osped., Sept., 1899.

³ Arch. f. Gynäk., Bd. LVIII, Heft 2, 1899.

different sizes, and in some severed the tubes with the thermocautery. Most of these attempts, however, were unsuccessful, and the lumen of the tube was found to persist, and to be reformed in spite of ligation. Various changes in the tubes followed ligation, the ligatures, when of silk, remaining unchanged. He then resected a portion of the tube and examined the animal 90 days after the experiment. It was found that the lumen of the tube had been apparently restored, and the same result followed with the use of the thermocautery. In some cases hydrosalpinx formed, and in a few, adhesions. He has collected a number of clinical cases in which a considerable portion of the tube has been removed, but in which pregnancy subsequently occurred, and this result is illustrated in his own experiments when he found the tube restored after amputation and ligation. He reaches the conclusion that the function of the tube can be destroyed only when the tube is entirely removed, its uterine termination excised, and the tissues closed with a flap of peritoneum.

Angiotripsy.—A new method of vascular torsion and compression is described by Clement Cleveland.¹ Nott invented a "rectilinear écraseur" 30 years ago for the cure of hemorrhoids and the removal of parts of the vaginal walls. In 1897 Doyen invented an instrument for controlling hemorrhage, which he named a "vasotribe." This was further improved upon by Thumin, of Berlin, whose instrument gave greater powers of pressure. Tuffier, of Paris, produced his angiotribe in 1898, which was perfected by Appert and is now used very frequently in the United States. In hysterectomy the instrument is used as a clamp to the broad ligaments, and very considerable pressure is brought to bear by means of a wheel, by turning which the blades, which are somewhat like those of a cephalotribe, are brought closer together. It is applied for 2 minutes, which is considered sufficient time to allow for the formation of clots in the vessels. "When the uterus is cut away, a short stump is designedly left projecting beyond the surfaces of the blades. When the instrument is removed, a flat ribbon of tissue the width of the blades is seen, with a ridge of tissue on the upper and under surfaces corresponding to the horizontal grooves previously mentioned. The design is that, after the removal of the angiotribe, there will be 5 barriers against the escape of blood. By this is meant that blood-clots will be formed in the vessels on both sides of the blades and also in the small central spaces produced, or rather left, by the grooves, and the compressed surfaces will be thoroughly agglutinated." The author then quotes the history of his first case, which was one of double tubo-ovarian abscess with a large septic uterus. The result was most satisfactory, there being the minimum amount of pain and not the slightest hemorrhage. He further relates 26 other instances in which this mode of treatment was adopted, in all of which recovery took place without any untoward symptoms arising. The great argument held against its employment is its weight and apparent clumsiness. This the author shows to be without any foundation. The advantages over the ligature and

¹ Med. News, Nov. 11, 1899.

the ordinary broad-ligament forceps appear to be numerous, and are given in detail. The paper concludes by a word on the precautions to be observed in its manipulation: (1) The instrument once removed, as little disturbance of the stumps as possible is enjoined; (2) it is advisable to apply the compression at right angles to the course of the vessels, as the clots form more securely if this is done; (3) it should not be applied too near the outer extremity of the broad ligaments, and the patient should be in the horizontal posture; (4) the instrument should be carefully and accurately made. J. R. Goffe¹ claims that the angiotribe has many advantages over the former method of clamp-forceps. These, left in place as they are applied one after another in operation, filling the vagina, more or less impede the progress of the work. When the angiotribe is used, on the contrary, additional space is gained with each application. Again, after from 36 to 48 hours the lock-forceps must be removed, and sometimes this is followed by hemorrhage, owing to the tissues adhering to the forceps and being torn as they are withdrawn. After the use of the angiotribe convalescence is smooth and complete; the patients commonly complain of less pain than when either forceps or ligatures are used. He gives an illustration of the ribbon of tissue formed by the angiotribe. (See Fig. 72.)

I. S. Stone² summarizes his conclusions on the angiotribe as follows: *Its field of usefulness*: In all cases in which fairly healthy firm tissue permits its use, the angiotribe as a compressor is nearly perfect in its action. In all necrotic tissues, or in myomatous or omental structures, its work has not been altogether satisfactory, and further study of its action is necessary. There is no reason why the ureters should be endangered by its use in supravaginal hysterectomy. Contrary to what has been predicted by many, the stump is not a mass of mangled and devitalized tissue, but a very small, neat, almost invisible line. *Pain*: The contrast between the suffering of patients treated by the wire clamp and after this method of performing hysterectomy is striking and convincing, and under no circumstances would the writer return to the clamp or wire, or even use *en masse* ligatures. It is not customary to witness severe pain after pelvic operations, when *en masse* ligatures are discarded, and we think patients subjected to supravaginal amputation should have as little pain as after a double salpingo-oophorectomy.

3. *Ligatures*.—V. F. Snegireff³ gives an account of his experience with *deer-tendon* as a material for sutures and ligatures, especially in abdominal and pelvic surgery. The writer had previously suggested⁴



Fig. 72.—The ribbon of tissue formed by the angiotribe (J. R. Goffe, in Boston M. and S. Jour., April 12, 1900).

¹ Boston M. and S. Jour., April 12, 1900.

² Am. Gyn. and Obst. Jour., July, 1899.

³ Russian Jour. of Obst. and Gynec., Jan., 1900.

⁴ Centralbl. f. Chir., Nov. 24, 1899.

the use of deer-tendon for this purpose, but at that time he did not have very much experience with this material. He gives the results of its use in 150 operative cases, most of them laparotomies for one or other indication, in which the tendon suture was used inside, and sometimes outside of, the abdominal cavity. Greiffe has studied the methods of disinfection and of preservation of deer-tendon for sutures. At present the following method of preparation is used: The tendon-threads are soaked in ether for 48 hours in order to remove the fat. They are then immersed in oil of juniper for 10 days, and then again in ether (to remove the oil of juniper) for 2 days. Next they are soaked in a 1:500 solution of mercuric chlorid in 80% alcohol, and finally kept in alcohol until used, when the addition of a little water will give the tendons the desired degree of suppleness. Greiffe found by experiments on animals that aseptic wounds never suppurate when sutured with this material, that the sutures leave nothing to be desired as to strength, and that they become thin after 12 days, and are absorbed in the course of 3 months. The material is not expensive and is easily obtainable. Greiffe has also devised glass tubes in which these sutures may be kept aseptic until used. The cases reported by the writer include sutures applied in the abdominal cavity, to the perineum, the vaginal wall, the cervix, and the skin of various parts during the preceding 18 months. Of the 150 cases, 103 terminated favorably, without any complications whatever. In 36 cases the temperature was above normal at one time or another after the operation, and 11 cases died. Of the latter, 3 were abdominal hysterectomies for myomas, 4 bilateral salpingo-oophorectomies, 1 enucleation of echinococci in the lateral ligaments, 1 enucleation of myomas, 1 herniotomy, and 1 unilateral oophorectomy. In no case were the sutures responsible for the infection. A very marked advantage of deer-tendon is the absence of infiltrations and of fistulous tracts in the wound, such as are often found in incisions sutured with silk. The threads are very strong and never give way; the knots never become loose after an operation. The tendons are slowly absorbed, and therefore give the wound time to heal well. They can be used in large numbers, as they consist of connective tissue and can be perfectly sterilized. The sutures do not require to be removed, and the wound heals remarkably evenly and securely in abdominal sections in which deer-tendon has been employed. The writer has used the tendons successfully in suturing the uterus after cesarean section. In wounds of the vaginal vault, such as those made in vaginal hysterectomies, they are very advantageous, as they do not require removal. The author dips the thread into tincture of iodine before employing the tendon in the vagina in order to insure absolute sterility of the material. In conclusion, he says that in his opinion deer-tendon is the ideal aseptic suture-material in abdominal surgery.

Schlutins¹ first saw **celluloid thread** used as suture and ligature material about 2 years ago, in the city hospital of Elberfeld, in the surgical clinic of Pagenstecher. After long experiment Pagenstecher had

¹ Pacific Med. Jour., Jan., 1900.

perfected and brought into practical and surgical use this thread, thus completing a work attempted years before by Linhart, and later by Trendelenburg and Lawson Tait. At first it was all prepared under the personal supervision of the hospital physician, but it is now made in

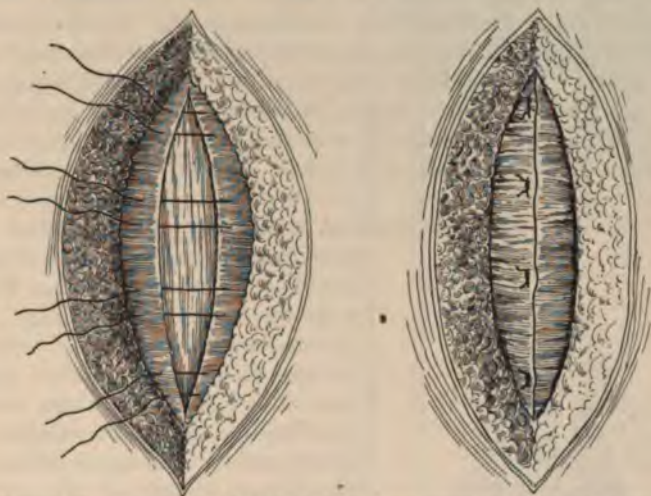


Fig. 73.—Closure of the aponeurosis with the modified mattress suture (C. P. Noble, in Boston M. and S. Jour., Mar. 8, 1900).



Fig. 74.—Showing closure of the peritoneum with continuous catgut suture; the borders of the (divided) rectus muscle; the left aponeurosis freed from the layer of fat; the right aponeurosis separated from the rectus muscle and reflected (C. P. Noble, in Boston M. and S. Jour., Mar. 8, 1900).

Fig. 75.—Showing the wound in the rectus closed with continuous catgut suture; closure of the aponeurosis by superimposing the right aponeurosis upon the left and suturing it with special form of continuous catgut suture (C. P. Noble, in Boston M. and S. Jour., Mar. 8, 1900).

large quantities as follows: The best English gray linen thread is boiled in a 1% soda solution and thoroughly sterilized, then packed in sterile cloth, and dried in a stream of hot air. It is then saturated in a specially prepared solution of celluloid, rendering it smooth and glossy,

and after being heated in large disinfectors, it is packed in sterile boxes ready for sale and use. Schlutins says that it is firm and strong, without the elasticity requisite to the loosening of the knot. It is easily threaded, readily tied, and, being hard and smooth, never softens by absorbing any secretion from the wound. For this reason, when it is used there is entire freedom from stitch-abscesses. It can be used in a finer thread than silk, and is, therefore, adapted to the most delicate surgical work. It is made in 5 sizes, the coarsest, No. 5, being best for ligature *en masse*. In conclusion, Schlutins expresses his belief that celluloid thread will eventually supersede all other suture-material, being much less expensive and better adapted to the needs of the surgeon.

C. P. Noble¹ gives his method of closing the wound of an abdominal section (Figs. 73-76) as follows: (1) The peritoneum is closed with fine cumol catgut (Fig. 74); (2) the aponeurotic sheath of one rectus muscle (the right) is then separated from the muscle by blunt dissection, thus baring the under surface of the aponeurosis. The upper surface of the aponeurotic sheath of the left rectus muscle is then dissected clear of fat with a knife, with the object of suturing the under surface of the right aponeurosis upon the upper surface of the opposite aponeurosis. The suturing is then begun by passing the needle, armed with medium chromicized catgut (sterilized by the cumol method), through the aponeurosis of the rectus muscle of the left side of the wound, and thereafter by continuous suture closing the rectus muscle until the opposite end of the wound is reached.



Fig. 76.—Showing suturing of the internal oblique and round ligament to Poupart's ligament; the aponeurosis of the external oblique reflected and ready for suturing (C. P. Noble, in Boston M. and S. Jour., Mar. 8, 1900).

The needle is then brought from below upward, through the aponeurosis upon the left side of the wound. The aponeurotic layer is then closed by passing the needle from below upward through the aponeurosis upon the right side; then passing it through the aponeurosis of the left side, as in the Lembert intestinal suture; and again from below upward through the aponeurosis of the right side, and so on until the end of the wound is reached, when a single knot completes the closure of the muscles and fascia. (Fig. 75.) Noble formerly closed the aponeurosis by means of the modified mattress suture. (Fig. 73.)

Complications During and After Abdominal Section.—*I. Wounds of the Intestine.*—A. H. Ferguson² has devised a clamp and

¹ Boston M. and S. Jour., Mar. 8, 1900. ² Am. Gyn. and Obst. Jour., June, 1900.

enterotome (Fig. 77), a modification of Grant's enterotome, which he uses as an aid in suturing in intestinal anastomosis. The bowel-clamps are applied to the bowel on each side of the field of operation for the purpose of preventing the escape of intestinal contents while operating. They are composed of 2 blades, one of which is fenestrated, and both are covered with rubber, so that the pressure does not come directly on the bowel between the blades, but on the rubber itself. This pressure is controlled by 2 screws, one at each end, which can be regulated to a certainty. The instrument is employed in extra-intestinal methods of suturing in end-to-end, lateral, or end-to-side anastomosis as an aid while doing the sewing. It is easily and rapidly applied; it minimizes the chances of soiling the peritoneum with intestinal contents; it holds the bowels firmly and securely together, so that the most accurate stitches can be quickly applied, thus greatly lessening the liability of leakage. It aids in completing the operation except the small hole through which the blades of the clamp entered; the stitches are inserted first, the intestinal walls cut afterward, and the pressure of the clamp on the blood-vessels of the mucous membrane for several minutes while sewing is being made lessens the tendency to hemorrhage. The new passage made between the bowels may be of any size necessary, thus preventing the possibility of stricture-formation. He gives illustrations (Figs. 78-80) showing the various forms of anastomosis.

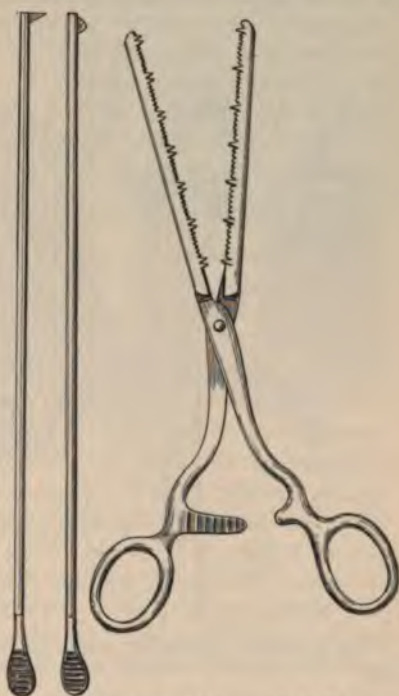


Fig. 77.—Enterotome and clamps (A. H. Ferguson, in *Am. Gyn. and Obst. Jour.*, June, 1906).



Fig. 78.—End-to-end anastomosis (A. H. Ferguson, in *Am. Gyn. and Obst. Jour.*, June, 1906).

illustrations (Figs. 78-80) showing the various forms of anastomosis.

2. *Shock and Hemorrhage*.—W. F. V. Bonney¹ states that the dis-

¹ *Lancet*, Aug. 5, 1899.

tion between these complications forms the most important problem in all the after-treatment of abdominal section.

Shock is often a post-hemorrhagic condition following severe loss of blood during a prolonged operation; these are the cases so difficult to distinguish from postoperative hemorrhage. In others it is a condition of true nervous shock, such as follows upon a blow in the abdomen, or both causes may be in operation at the same time. In both shock and hemorrhage the face is cold, the lips are blanched, and the pulse is fast—140 or more. The face is always blanched in hemorrhage, but it may be considerably less so in shock. The pulse, exceptionally, in both shock and hemorrhage may be slow, but this is much more likely to happen in shock. Signs of shock date from

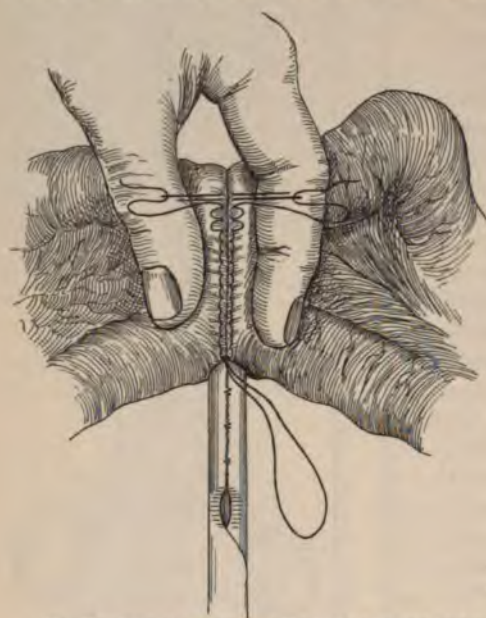


Fig. 79.—Lateral anastomosis; cobbler interlocking suture (A. H. Ferguson, in *Am. Gyn. and Obst. Jour.*, June, 1900).

the operation, but signs of hemorrhage develop at some definite period afterward, and frequently quickly. This is the surest distinction between them. Shock tends to improve progressively, but hemorrhage gets progressively worse. In hemorrhage the patient is restless, but in shock she is quiet, as a rule. In hemorrhage the respirations are often sighing, while in shock they are quick and shallow. Enemas of brandy cause shock to improve, but hemorrhage would only be made more ap-



Fig. 80.—Lateral anastomosis; Ferguson's continuous suture (A. H. Ferguson, in *Am. Gyn. and Obst. Jour.*, June, 1900).

parent by its administration. Dullness in the iliac fossa is a fallacious sign of hemorrhage, for the bowels get floated up against the parietes. The detection of a fluctuating tumor in the pouch of Douglas would

be of more service. The necessity for a correct distinction between shock and hemorrhage lies in the question of saline transfusion. If shock be diagnosed, an ounce of brandy *per rectum* is to be given at once, together with 10 ounces of hot water if there has been previous hemorrhage. A hypodermic injection of 5 minims of strychnin is also indicated. If the shock be severe or the patient does not react to these measures, saline venous transfusion, to 2 or 3 pints, must be unhesitatingly adopted; this is specially indicated in posthemorrhagic shock. If hemorrhage, however, is diagnosed, there is but one thing to do, namely, to secure the bleeding vessel.

A. C. Heffenger¹ remarks that the **danger of secondary hemorrhage** should always be borne in mind, for it may occur any time within a week or 10 days. [Kelly enumerates the chief causes of secondary hemorrhage as follows: viz., (1) defective tying; (2) cutting too close to a ligature; (3) undue traction on a ligature after tying; (4) the shrinkage of the tissues within the grasp of the ligature; (5) an extensive capillary oozing. To these must be added the softening and untying of catgut ligatures, even though well tied, and this is especially liable to happen if the ends are cut too short. The symptoms of secondary hemorrhage are: (1) Sudden quickening of the pulse and diminution in volume without apparent cause, or even an entire loss of pulse; (2) quickened sighing respiration and the use of the extraordinary muscles of respiration; (3) increasing pallor and a pearly conjunctiva; (4) cold clammy skin; (5) vertigo; (6) restlessness, throwing the arms and legs from side to side; (7) desire to be raised in bed (orthopnea); (8) pain in the abdomen, often severe; (9) vomiting sometimes.]

3. *Ileus*.—Werth² reports 11 cases of intestinal obstruction in 1000 abdominal sections, with 6 deaths. In 2 cases the abdomen was reopened and adhesions were separated with success; in 9, enterostomy was performed, with 3 recoveries. In the majority of cases ileus is due to slight local obstruction with general paralysis of the gut above the site. Enterostomy offers a better prospect of recovery than reopening of the abdomen, on account of the serious condition of the patient. Although sepsis is often the cause of ileus, it may occur after a perfectly aseptic operation from mechanical injury to the serous covering of the gut. The latter may be avoided by the adoption of Trendelenburg's posture, by making a small incision close to the symphysis, and protecting the intestines as much as possible while removing the tumor. Dangerous adhesions are most likely to occur in the neighborhood of the abdominal wound, at the stump, and in Douglas' pouch. These are prevented by carefully suturing all raw surfaces in the parietal peritoneum near the edges of the wound, by covering the stump with peritoneum, and by temporarily excluding the coils of intestine from Douglas' pouch by overdistingending the bladder. If the bladder is filled with sterilized boric acid solution during the operation, the additional advantage is gained of causing the patient to urinate spontaneously afterward.

¹ Med. Rec., July 22, 1899.

² Centralbl. f. Gynäk., No. 40, 1899.

The writer is opposed to the use of purgatives before operation, believing that they are more likely to cause subsequent atony of the intestine. He prefers phosphate of codein to morphin, as it is less likely to hinder peristalsis.

4. *Ventral Hernia*.—Martin¹ remarks that it is well known that stretchings and irregularities of the abdominal scar develop after all kinds of incision. Probably abdominal scars are the most prone of all to undergo distortion. Often a stitch-aperture is the origin of a hernia. This gradually increases until a large rupture is developed, with all its well-known characteristics. These are especially serious after extraperitoneal treatment of the stump, abscess-formation, and abdominal drainage. Many attempts to avoid such untoward sequelæ have been made. From the major incision of the old surgeons, a change was made to an opening as small as possible. Some operators, Lawson Tait especially, made the incision so small that only 2 fingers could be inserted. But the resulting scars also stretched. Then the linea alba was thought unsuitable for incision, and so this was made in the rectus muscle itself, either in its outer border or in the flank. The skin was cut crosswise, the fascia and muscles were divided lengthwise. Finally, abdominal binders were thought to give a perfect support to the scar, and numerous varieties were tried, but they did not yield the desired results. It was early observed that the scars following suppurating wounds, as well as those after extraperitoneal treatment of the stump and drainage, were especially disposed to stretch. The first progressive step was taken in the introduction of asepsis. Next, instead of suturing the abdominal layers *en masse*, the separate layers were stitched together one by one. Martin makes his incision exclusively in the linea alba. It is noticeable that most hernias resulting from scars do not cause much trouble, at least if a suitable binder is worn, though there are the same discomforts as in other ruptures: namely, pain on pressure, nausea, a feeling of weight, nervous symptoms, etc. Generally, the patient's capacity for work is interfered with. An effective treatment of beginning hernia is not known. Martin has used bands of adhesive plaster to avoid the stretching of the stitch-punctures. Many surgeons employ abdominal binders; others make use of a suitable corset with an elastic lower border. In the worst cases, of course, operative treatment may be advised. A. L. Smith² says that this accident is quite preventable: (a) By leaving in the stitches a month if the woman is thin enough to allow the use of through-and-through stitches; (b) by using nonabsorbable buried sutures when the woman is fat enough to require 2 layers of ligatures; (c) by discarding the abdominal drainage-tube and, when drainage is necessary, which it rarely is, draining by the vagina; (d) by securing accurate coaptation of the cut edges by marking the places where the stitches are to go before the incision is made; and (e) by taking care that no peritoneum is curved up so as to come between the muscle and fascia of the opposite sides.

Vaginal Incision for Pelvic Disease.—Hayd³ criticizes the

¹ Klin. Vorträge, No. 255, 1899.

² Lancet, July 29, 1899.

³ Buffalo Med. Jour., Dec., 1899.

wholesale adoption of the vaginal route for the evacuation of pus in the pelvis, as advised by some Continental gynecologists. He thinks that vaginal operations in the pelvic cavity are more difficult to perform than through an abdominal opening. Vaginal surgery is necessarily less complete and the dangers and risks of accident to important structures are infinitely greater than in operation by abdominal section. For instance, the author has on several occasions delivered a large pus-tube or ovarian abscess, and found that he had torn off the appendix vermiformis, or needed to remove it because it was so disorganized, and he had even found a long appendix adherent to the left tube or ovary. Further, the possibilities and necessities for conservative surgery of the tubes and ovaries are out of the question when the operative procedure is by the vaginal route. The consensus of the best surgical thought of to-day is to leave the uterus, when possible, to support the lower abdominal segment. Only such portion or portions of the ovaries or tubes are to be removed as are irreparably diseased, so as to continue as long as possible the function of menstruation.

DISEASES OF THE OVARIES.

Transplantation of the Ovaries.—[The great success which has attended the therapeutic use of preparations of the thyroid gland has led, perhaps, to somewhat wild and unscientific hopes as to the effects of derivatives from other animal tissues. Certainly there is as yet no convincing evidence that real benefit can be expected from the employment of ovarian extract, though it has been extensively tried for menstrual disorders, anemia, epilepsy, and the like, and some observers have alleged good results in isolated instances. There is reason to fear that in estimating the progress of these cases the wish has been too often father to the thought. Very interesting and suggestive experiments have, however, been made during the past year by several workers on the effects of transplantation of the ovaries.] Knauer,¹ of Vienna, has reported the results of his researches in this direction, and he has arrived at conclusions very similar to those recorded by McCone.² It appears that ovaries grafted from one part of an animal to another part will continue to grow and remain functionally active, and in some cases these observers assert that pregnancy can and does occur. The best results are obtained when the raw pedicle of the transplanted ovary is attached to a denuded surface. The American experiments are also said to have demonstrated that ovaries grafted from one animal to another of the same or even of a different species retain their functions, and that the atrophy of tubes and uterus which usually follows castration is by this means prevented. Recently an astonishing case has been recorded by J. H. Glass³ in which a human ovary was implanted in a patient for the relief of untoward symptoms following oophorectomy, and with complete success. A good deal of confirmatory evidence

¹ Wien. klin. Woch., Dec. 7, 1899.

² Am. Jour. Obst., Aug., 1899.

³ Med. News, April 29, 1899.

would be necessary before these statements could be accepted as facts. [There are many points in connection with the anatomy and functions of the ovary which would suggest that, if its influence in the economy, which must be a potent one, can be artificially supplied at all, this end is most likely to be achieved by a grafting of the intact and living organ. If results should be found to justify such an expectation, a most important and useful addition would be made to the resources of the gynecologist. But if pregnancy might follow such a procedure, as is alleged to be the case in rabbits and guinea-pigs, many serious and delicate questions of a social and medicolegal nature would demand earnest and anxious consideration before the operation could be pronounced justifiable. The complete reestablishment of menstruation after it had ceased, owing to the removal of both ovaries, as in Glass's case, is a remarkable circumstance. That this was apparently due to the transplanted ovary seems quite certain, yet numerous cases have been reported in which both ovaries have been removed, but menstruation did not cease. An improvement in the general health might account for a restoration of function, even in cases in which an artificial menopause had been established. The case is of sufficient importance to lead to experimental study of the value of ovarian transplantation.] Marchese¹ reports the result of a series of experiments in animals in which the ovaries were removed and transplanted either to a distant site in the same animal (between the parietal peritoneum and psoas, between the fascia and rectus, or beneath the folds of the broad ligament) or to the pelvis of another animal. Rabbits survived the operation only a short time, but only one of the dogs operated upon died of peritonitis. The results varied greatly. While many of the ovaries were found to be nearly or quite normal after the lapse of several weeks (5 months in one instance), in others more or less marked necrotic changes were observed, especially at the points of entrance of the ligatures. In no instance was there any change in the general condition of the animals or any increase in adipose. The writer infers that ovaries may be transplanted from one animal to another, or from their normal position to distant sites in the same animal, without impairment of their functions. In order to insure the integrity of a transplanted ovary it is important not to transfix it with sutures, but to attach it by means of a new pedicle, avoiding any possible compression from neighboring organs. Ribbert,² in experimenting with guinea-pigs, found that within 30 days after transplanting ovaries to the uterine cornua or broad ligaments the tunica albuginea and germ epithelium were nourished directly from the peritoneum, so that the primordial follicles retained their normal appearance. On the other hand, the stroma, with the larger follicles, was destroyed, its place being taken by a new growth of connective tissue derived from the peritoneum. Contrary to Arendt's observations, he found that progressive changes took place in the transplanted gland, the primordial follicles maturing and encroaching upon the stroma more actively than in the normally situated ovary. When examined after an interval of 3 months,

¹ Centralbl. f. Gynäk., No. 31, 1899.

² Centralbl. f. Gynäk., No. 23, 1899.

instead of atrophy having taken place, there was an actual increase in the development of the ova. A series of 12 experiments performed upon rabbits by H. Rubinstein¹ gives results that have a bearing upon removal of the uterine appendages. In 12 rabbits the ovaries were excised, and they were left free in the abdominal cavity in 7 of them, while in the other 5 they were grafted at some point on the peritoneum. After some time the animals were killed and histologic examination was made of the uterus, with the following results: In those cases in which the ovaries, whether left free in the peritoneal cavity or grafted on to the peritoneum, had been resorbed, the uterus presented the classic lesions of atrophy from castration—that is to say, atrophy of the mucous and muscular layers, thickening of the vessels, and proliferation of connective tissue in all the layers of the uterine wall. On the other hand, in those cases in which the ovaries had taken root and continued to exercise their functions this atrophy did not take place. From these facts the author concludes that the atrophy of the uterus supervening upon ablation of the ovaries is not due to the destruction of the circulatory and nervous connections between these organs, but to the abolition of the ovarian secretory function.

Causes of Ovarian Pain.—C. Halley² says that patients often complain of excessive pain in the lower part of the abdomen, which is not confined to the pelvis, but radiates upward and backward, following a line about 2 inches inside the crest of the ilium. Sometimes the pain is on the outside of the back of the thigh; sometimes it is confined to the lower portion of the iliac fossa and upper 2 inches of the thigh. It is usually of a dull, aching, persistent character, increased by motions or pressure. It varies in its relation to the menstrual periods. The usual symptoms occurring with this condition are constipation, painful or difficult micturition, nervousness, sleeplessness, and prostration. While cystic degeneration of the ovary is often the cause of this train of symptoms, in many cases it is due to a varicose condition of the pampiniform plexus. The veins composing the plexus are sometimes as large as a lead-pencil and tortuous, with the walls enormously thickened. This condition can usually be differentiated from cystic ovary. In the latter case the ovary is very tender and the pain is most severe during the menstrual period, while in the former condition the greatest freedom from pain is after the menstrual flow has been fully established and the ovary is free from tenderness. In cases of cystic ovary menstruation is irregular, the periods being much further apart than normally, while in the varicose condition of the plexus the flow often occurs twice in a month, though in both conditions there may be normal menstruation. Hot douches aggravate all the symptoms. The writer's treatment is to ligate both ends of the vein of this plexus with some good strong material, and cut out, or ligate and cut out, the veins, just as is done in most cases for the radical cure of varicocele. The ligation must be very thorough, as the artery will produce a hyperemic condition of the ovary and there is

¹ St. Petersburg med. Woch., No. 31, 1899.

² Jour. Am. Med. Assoc., April 29, 1899.

danger of hemorrhage from the ends of the cut vessels. The reason that operations on the ovary often fail to relieve pain is owing to the fact that the plexus, and not the ovary, is diseased. Even when the ovary is cystic, it is possible that ligation of the veins might be beneficial, if not curative, and the woman would still be sexually perfect.

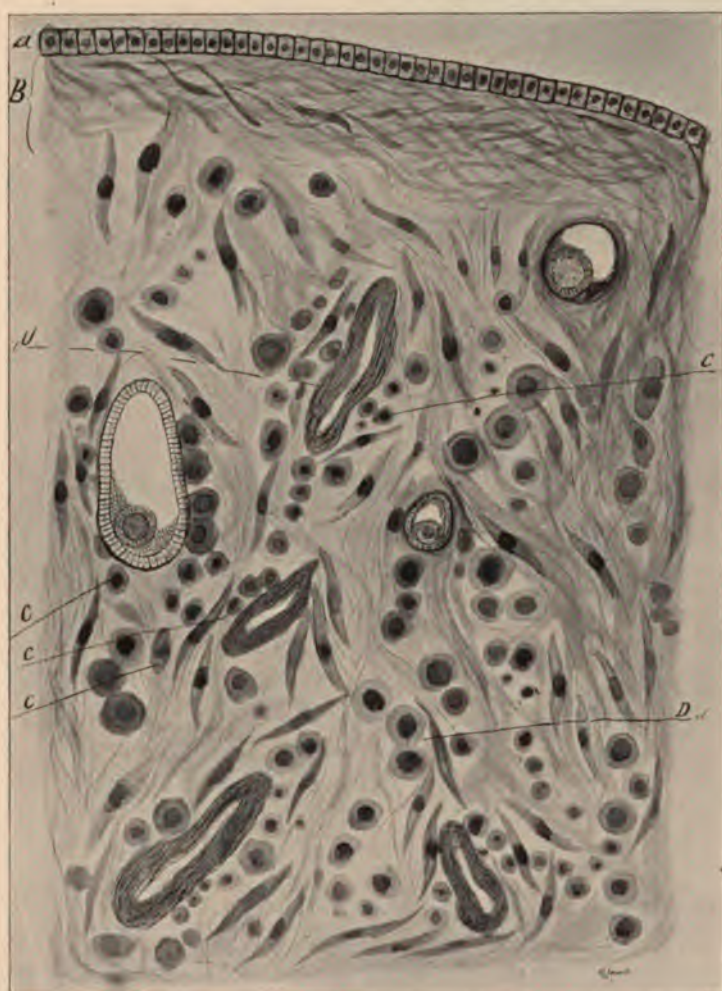
Oophorectomy and Hysterectomy in Animals.—[The experience of veterinary surgeons on this subject is of interest at present, when the question of natural and artificial or surgical menopause has been under discussion in the Section of Obstetrics and Gynecology at the Portsmouth (England) meeting.] Hobday¹ reports 55 cases of oophorectomy (18 in bitches, 37 in cats) for the relief of troubles due to estrum and its sequelæ, or for disease. The details of the operation are of little value to the general surgeon or gynecologist, as the lower animals for many reasons require different manipulations and different after-treatment; nor are the after-histories long enough to be reliable in scientific evidence; but some immediate results are of interest. In one case both the ovaries were carefully removed from a bitch, yet a fortnight after the operation she was distinctly *in œstrum*, and admitted the approaches of a dog. Leeney has recently reported similar observations of the recurrence of estrum after complete removal of the ovaries, but believes that the estrum will not return if the operation is performed when the bitch or cat is pregnant. But Hobday reported previously in the "Veterinary Record" one case in which the gravid uterus as well as the ovaries were removed, yet the "patient" has been twice *in œstrum* since the operation, which was performed early in May. [Thus, there is much yet to be learned about the effects of the extirpation of the ovaries in *canis* and *felis*. That fact is certain, and it is equally certain that much is yet to be learned respecting the same effects in our own species. Fifteen years ago most of us believed that removal of the ovaries cured uterine fibroids. For several years some authorities have declared that it is the fibroid and the uterus that should be removed, while the ovaries ought to be left; then, they maintain, there will be no troublesome artificial menopause. Zweifel and Abel, however, have found out from experience that under these circumstances the menopause is merely delayed for a year or two. Possibly we are too much alarmed about the dangers and inconveniences of an artificial menopause. Double ovariectomy at least is not followed by very evident physiologic troubles.]

Clinical and Microscopic Differentiation of Sclerocystic and Cirrhotic Degeneration of Ovaries and Chronic Ovaritis.—W. H. Humiston² refers to the still prevalent custom of regarding the condition of the ovaries termed cirrhotic and sclerocystic degeneration as mere sequences of acute ovaritis—no pathologist has so far attempted to separate these primary degenerations from those secondary to inflammation. A cirrhotic ovary is smaller than the normal, is hard and inelastic, and usually deeply corrugated. A sclerocystic ovary, however, is 2 or 3 times the size of the normal organ, and is globular rather than ovoid. The surface is smooth and glistening, and studded with slight elevations

¹ Brit. Med. Jour., Aug. 12, 1899.

² Jour. Am. Med. Assoc., Sept. 23, 1899.

PLATE 4.



Secondary or inflammatory sclerosis (diagrammatic): *a*, Germinal layer, usually absent and replaced by round cells or connective tissue; *B*, tunica, not much thickened nor fibrous; *c, c, c*, round-celled infiltration with increased nuclear elements as compared with the primary form; few fibrous elements also; *D*, epithelial cells of the stroma; *U*, thickened vessel-wall and seen near the surface (W. H. Humiston, in Jour. Am. Med. Assoc., Sept. 23, 1899).



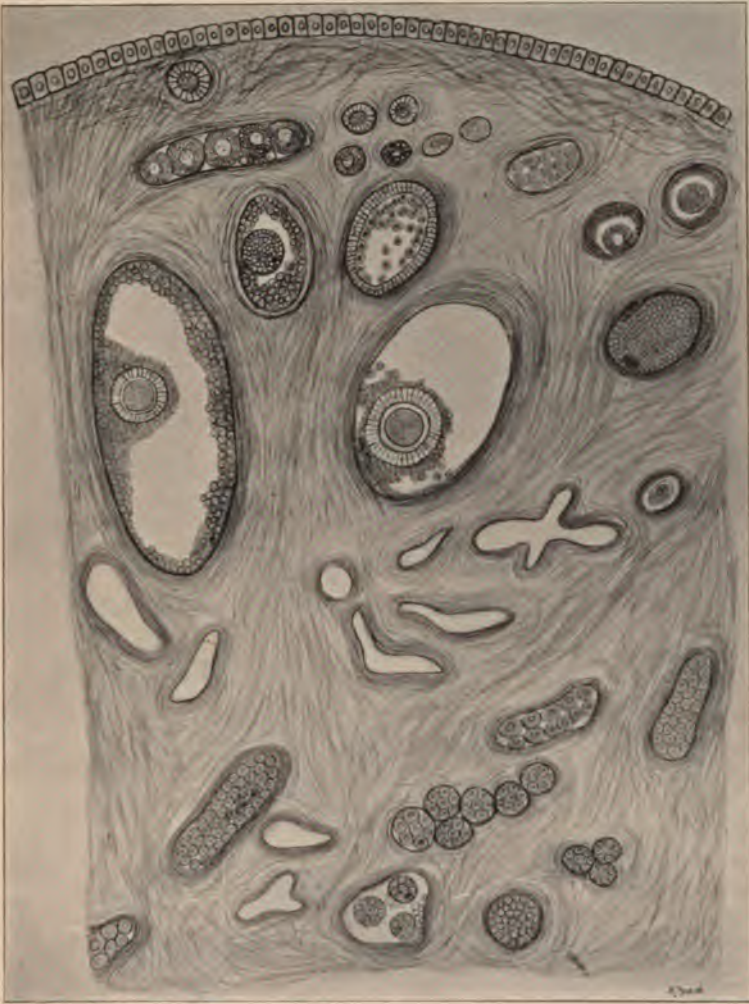
PLATE 5.



Primary or noninflammatory sclerosis (diagrammatic): *a*, Germinal layer, somewhat flattened and with small nuclei; *a'*, thickened fibrous tunica; *B*, follicle which fails to break through the tunica; *c*, absence of round-celled infiltration—only a few connective-tissue cells with increase of fibrous elements in the stroma; *D, D*, a few scattered epithelial cells of the stroma; *U*, vessel-wall, slightly thickened (W. H. Humiston, in Jour. Am. Med. Assoc., Sept. 23, 1899).



PLATE 6.



Normal ovary (Waldeyer) (W. H. Humiston, in Jour. Am. Med. Assoc., Sept. 23, 1899).



caused by enlarged Graafian follicles beneath the tunica albuginea. These follicles vary in number from 5 to 20 or 30. The largest are found near the surface. On section, numerous smaller ones are found nearer the center. The tunica albuginea is always greatly thickened, and is firm and unyielding. The hilum also is usually the first portion of the ovary to show corrugations. In a smaller portion of the cases the vessels within the folds of the broad ligament are sclerosed. The author finds that the differences between the primary (noninflammatory) and the secondary (inflammatory) degenerations are well marked. In the latter is found, on making a section of the ovary, a small round-celled infiltration on the connective-tissue elements in some of their various stages of development. The numeric relation of nuclear to cellular elements is always larger, however advanced the fibrosis may be. In the latter, too, the vascular microscopic appearances are different. In the inflammatory group we have primarily a dilation of the vessels with secondary contractions of their greatly thickened walls and a lessening of their lumina. No thickening of the vascular walls occurs in the primary group, nor is there any dilation—the epithelial cells of the ovarian stroma are diminished both in number and size. In making a diagnosis the author tabulates the primary and secondary forms. In the former there is no history of infection; patients from puberty to 30 are the subjects of it; there is frequently dysmenorrhea, amenorrhea, or delayed catamenia; cystitis is rare. The kidneys often show signs of granular degeneration. There are no indications of perimetritis. One or both ovaries are usually prolapsed, firm and unyielding, and of globular shape. Neurasthenia is a frequent accompaniment or sequence. In the latter form there is a history of infection followed by dysmenorrhea; endometritis is always present, and usually menorrhagia. There are distinct evidences of perimetritis; the ovaries are prolapsed and immobile from the presence of adhesions. The author illustrates his paper by three very valuable microscopic plates. (Plates 4, 5, 6.)

Ovarian Cystoma.—Beyea¹ reports a case of pseudomucinous cystadenoma associated with diabetes. His conclusions from the study of the literature are as follows: (1) In rare instances in which disease of the female internal genital organs is associated with diabetic symptoms, and a large quantity of sugar is found in the urine, the diabetic symptoms and sugar in the urine seem to be dependent on the disease of the genital organs. (2) In other cases the excretion of a large amount of sugar by the kidneys without diabetic symptoms seems to be dependent also on the disease of the female internal genital organs. (3) Since in every case of any class or classes of disease of the female internal genital organs no such association has been observed, it is probable that, in order to produce the diabetic symptoms, and excretion of sugar by the kidneys, there may be present, in addition to the disease of the genital organs which we are able to recognize, some special and separate lesions or abnormal secretions of the genital organs, or some affections of other organs, or some special predisposing condition of the body.

¹ Am. Jour. Obst., Feb., 1900.

(4) That such cases of diabetes as are described by him, and those cases to which Tait and Lecorche have given the name "climacteric diabetes," may be cured by the induction of the climacterium, the removal of the gross disease which allows the completion of the climacteric change, or by the progress of the normal climacterium. The writer believes that the subject of association of disease of the internal organs of the female with glycosuria and diabetes is worthy of serious consideration, and that there is sufficient evidence of an etiologic relationship between the two diseases to stimulate careful observation of cases of this class and experimentation aiming to determine the question of cause and effect.

Dermoid Cyst of the Ovary.—J. G. Clark¹ presents an interesting review of the recent research of Kroemer concerning the histogenesis of the so-called dermoid cysts of the ovary. As the final result of his review of the literature and of his study of 12 cases, Kroemer reached full agreement with Wilms, who was the first to offer any proof of the ovulogenous development of these tumors. The theory which has ascribed these tumors to inclusion of the ectodermal layer in the early growth of the embryo has never been satisfactorily proved. The principal objection to this theory is that ovarian dermoid cysts do not correspond to the type seen in the superficial parts of the body, where dermoids undoubtedly come from the ectoderm, because they contain only those tissues which are found in this layer. Arnsperger² reaches the same conclusions as Wilms and Kroemer. One of the tumors which formed the basis of Arnsperger's investigation was as large as a goose-egg, and grew in the right ovary of a woman 27 years old. The special feature of this tumor was a complete trachea, and also structures which corresponded to the stomach and intestines, as well as a distinct head region. The development of this entodermal tube was especially interesting because the individual parts of which it was made up maintained the same relationship to each other as in a rudimentary embryo. The growth originated entirely from the ovary. In two other cases he also found distinct entodermal elements. The number of instances of so-called dermoid cysts of the ovary in which entodermal elements and rudimentary organs of various kinds, including more or less fully developed brains and retinal epithelium, as well as true optic vesicles, rudiments of ears, cranial nerves, ganglia, a quite complete medullary tube, as well as the remarkable observation of Kroemer of a sympathetic plexus within the muscular wall of an intestinal tract, are becoming quite numerous. As already indicated, dermoid cysts usually develop from the inside of the ovary; in a few instances the tumor has been attached to the ovary by a thin pedicle. As pointed out by Kroemer, these formations are neither simple tumors nor cysts, but consist of a cystic portion and of the varied embryologic elements enumerated. The changing form of the cystic portion and in the growth of the dermoid itself, gives rise to the variability in the general appearance of the tumor. According to the views advanced by Wilms, Kroemer, and Arnsperger, the cystic portion of those growths is of follicular origin, while the em-

¹ *Progressive Medicine*, June, 1899.

² *Virchow's Archiv*, 1899, 156, p. 1.

bryologic parts are of ovulogenous development. In an observation by Lee a diminutive dermoid maintained the same relationship to the follicular cavity as the ovum to the follicle. Sutton made the same observation in the case of a dermoid cyst in the ovary of a mare. Kroemer likewise made out a similar relationship of the tumor to the follicle in two cases. The epidermal lining of dermoid cysts, therefore, appears to be derived from the ectoderm of the ovum. It would, therefore, seem that a dermoid cyst of the ovary in reality represents an ovum, and that the cyst is the more or less successful result of parthenogenesis. Kroemer points out that it is hardly correct to attribute the development to parthenogenesis proper, because this is a normal process in lower plant and animal life for the propagation of species, while in this case it was a distinctly pathologic process, in which the growth, differentiation of organs, etc., are atypical and occur without any definite law. The dermoid cysts of the testicles are explained by Wilms in somewhat the same manner. In this case the various portions of organs and tissues are derived from pathologic growth of the sperm-cell. It has been suggested that these tumors be designated as embryomas, and it is thought that the development of the structures from the single ovum or sperm-cell is greatly hindered because of the confinement in the small space of the cyst, so that only rudiments of embryos are developed. In what manner the ovum or sperm-cell is stimulated to this anomalous growth is at present entirely mysterious.

ORTHOPEDIC SURGERY.

By VIRGIL P. GIBNEY, M.D., AND J. HILTON WATERMAN, M.D.,
OF NEW YORK.

Tendon Transplantation in the Treatment of Deformities of the Hand.—W. R. Townsend,¹ at the meeting of the American Orthopedic Association, reviewed the literature of the cases operated on, 23 in all, and reported 3 cases of his own, the most interesting being that of a male, 14 years of age, who had right hemiplegia, due to cerebral palsy of infancy. Instruments were used at the time of birth, but no damage apparently was done to the exterior of the skull. The patient has had treatment by electricity and massage, and some years ago had his heel-cord cut. Has never been able to use the right hand, and it is held in a typical position of claw-hand, it being sharply flexed at the wrist, and the fingers flexed on the palm of the hand; the back of the



Fig. 81.—Maximum extension before operation (Townsend, in *Med. News*, July 14, 1900).

hand is held nearly at a right angle to the forearm. By a voluntary movement he can extend the fingers slightly, but can not extend the wrist. At the Polyclinic Hospital, under ether anesthesia, Esmarch bandage at elbow, the forearm and wrist having been cleansed thoroughly with green soap and bichlorid dressing, all hair having been removed by shaving, an incision was made in the middle of the flexor surface over the wrist, exposing the tendons. The flexor carpi radialis, the flexor carpi ulnaris, and the palmaris longus were divided by scissors just above the annular ligament. Silk was stitched to each tendon, and each fastened to an artery clamp, so that they should not draw up out of reach. The parts were then covered with sterile gauze, and the hand turned over and an incision made on the dorsum of the wrist; the extensor communis digitorum was exposed about $1\frac{1}{2}$ inches above the joint, the tendon being pulled to one side; the dissection was made through the upper edge of the pronator quadratus and between the bones

¹ *Med. News*, July 14, 1900.

to connect with the flexors previously cut. These tendons were then slipped through, and to the extensor communis was attached the 3 flexor tendons previously mentioned. The lengthened extensor communis digitorum was folded on itself twice, so as to shorten it, and between these folds the flexor tendons were stitched. The sewing was done with chromicized catgut. The wounds were then closed with catgut, and dry dressings applied. The hand was placed in a hyperextended position and a plaster-of-Paris bandage applied. The wounds healed *per primam*, with the exception of one little spot on the flexor side, where a suture pulled out, which granulated over and closed inside of 10 days. All dressings were removed at the end of that time, and the arm was bandaged and placed in a splint, with a pad of gauze under the hand to keep it and the fingers



Fig. 82.—Maximum flexion before operation (Townsend, in Med. News, July 14, 1900).

in extension. The splint, etc., were removed at the end of 6 weeks, and the patient has simply carried his hand in a sling since then. The reason for so long delaying the removal of the dressings was to insure, as far as possible, perfect union of the sutured tendons. The hand is held perfectly straight in line with the forearm. The patient has power to extend and flex. He has fair grasp of the



Fig. 83.—Flexion after operation (Townsend, in Med. News, July 14, 1900).

fingers; had none before, owing to the position in which the hand was held. When the electrical current is applied to the flexor carpi radialis, it is seen that a contraction occurs under the scar, on the dorsal surface of the forearm. (See Figs.

81-84.) The practical point is that, with the flexor tendons attached to the extensors, when the patient wishes to extend the hand, the cases already operated upon show that the proper motion results, although the extension is accomplished by contraction of flexor muscles.

Osteo-arthritis of the Spine.—Spondylitis Deformans.—Goldthwait¹ uses this term to designate a disease of the articulation, which is characterized pathologically by a marked proliferation of the edges of the articular cartilage, associated with an atrophy or a degeneration of

¹ Boston M. and S. Jour., Aug. 10, 1899.

the cartilage at the points of pressure, the two conditions producing an impairment of function of the joint, varying from the slightest inconvenience to complete ankylosis. He states that, in all, about 45 cases have been reported, and contends that the clinical picture in this condition differs entirely from that in arthritis deformans. The treatment is both medicinal and mechanical. The general treatment should be wholly nourishing and stimulating—extra diet, stimulation, bathing, massage of the unaffected parts, electricity in a mild current, cod-liver oil, and tonics internally. For mechanical treatment some form of spinal support should be used at once, partly to relieve the pain by restricting the motion, and partly to prevent the marked deformity from developing. Attempts have been made to break up the ankylosis forcibly, but the results have been unsatisfactory. [This condition has been recognized and

described under various terms. We agree with the author as to the method of treatment.]

New Method of Fastening Children on Bradford Bed-frames.

—R. T. Taylor¹ describes a method which he uses for this purpose. The writer has made a short apron of twilled cotton, with buttonholes at the neck and axillæ. Buttonholes are worked in corresponding positions in the frame covers; and webbing,



Fig. 84.—Extension after operation (Townsend, in *Med. News*, July 14, 1900).

straps, and buckles passing through these, fasten the child's shoulders securely down. A similar arrangement is made at the pelvis.

The Kyphotone.—R. T. Taylor² describes an apparatus for applying plaster-of-Paris jackets. The technic of this method is as follows: The patient is placed on the saddle and the legs and hips are made fast; the portion of the spine below the deformity, by means of the pressure-rod placed an inch above the apex of the kyphos, is then made perpendicular to the floor. Then the head-sling is put on, and as much traction is made as the patient can tolerate, the hands being fully extended upward and backward on the handle-rods. That portion of the upright which is above the pressure-rod is carried back to any angle at which it is desired to make traction before actual extension is applied. As soon as traction is made on the head-sling, the padded pressure-plate comes over or just below the apex of the kyphos.

Summer Plaster-of-Paris Jacket for Pott's Disease.—R. T. Taylor and T. H. McKim³ present a jacket which virtually consists in

¹ N. Y. Med. Jour., June 9, 1900.

² N. Y. Med. Jour., May 12, 1900.

³ N. Y. Med. Jour., May 26, 1900.

a figure-of-8 bandage. Starting at the sternum, these are carried backward and downward over the corrected gibbosity; thence forward around the ilia, and in the reverse order to the starting-point, recrossing in the back, where small strips of zinc can be molded in with the hand and incorporated in the jacket to strengthen it. The writers state that this method can be used only in conjunction with the kyphotone, with a pressure-rod for lessening the deformity.

Scorbutic Spine.—J. Ridlon¹ reports a case of this kind occurring in an infant of 12 months, which came on very suddenly. The range of motion at the ankles, knees, and hips was normal. The spine was arched forward and held rigidly. It was differentiated from rickets by the suddenness of onset, and there was no other evidence of this disease besides the spinal symptoms.

Anomalous Spinous Process of Seventh Cervical Vertebra Articulating with the Scapula.—Wilson and Rugh² report 2 cases presenting this condition. The first case was that of a child of 7, whose general appearance was that of one affected with torticollis. The head seemed markedly drawn to the left side, and attempted movement to the right showed the cervical muscles on the left side to be much shortened and quite tense. The spare condition of the child permitted the outlining of all the spinous processes except that of the first dorsal. Movement at the scapulohumeral joint was free and normal in all directions. When, however, both hands were put forward, the left was found about $1\frac{1}{2}$ inches shorter than the right; also there was inability to stretch the arm directly upward. When these movements were attempted, the scapula was seen to move about a point at its posterior superior angle as a center, and could not be raised or lowered, moved forward or backward, or rotated, as could the other. In this case operation was performed. The incision was made directly over the vertebroscapular articulation, and the interposed bone was readily exposed. The scapular end was first separated, and the bone was seized with strong artery forceps and cut off about $1\frac{1}{2}$ inches higher up. The scapula was then found freely movable. The wound was closed, and healing by first intention followed. Later free gymnastic exercises were given to increase the mobility of the scapula. The two shoulders are now the same length, and there is every reason to believe that, when the patient has attained its growth, there will be present no traces of the former condition. In the second case definite information was obtained through recourse to the x-rays. This showed the presence of an unnatural substance, having about the same density as the ribs in the same subject, and occupying an oblique position, which in the skiagraph appeared to start from the cervical vertebrae somewhere below the skull and to extend to the left scapula. The spinal column was shown to be curved, with concavity to the left, which is not in accord with cases of rotary lateral curvature, where the left scapula is higher. It was now evident that further and definite information could be obtained only by an exploratory incision, at which time the apparently supernumerary bone could be excised, if

¹ Med. Rec., June 23, 1900.

² Ann. of Surg., April, 1900.

practicable. At the operation this was done, and the bone removed was 2 inches long and $1\frac{3}{4}$ inches in circumference, being firmly attached at its spinal end by bony union, yet showing signs of having had other form of attachment in early life. At the scapular end there was a well-rounded, articulating surface where it was in contact with the edge of the scapula. After searching the literature the writers are unable to find anything that corresponds to these two cases. The characteristics of both specimens render justifiable the theory that there has been an extra center of ossification for a spinous process, and this has been pushed or placed beyond the normal center for the process of the seventh cervical vertebra, though this does not account for the fact that in both cases there was firm articulation with the scapula.

The Mechanics of Lateral Curvature of the Spine.—R. W. Lovett,¹ in an interesting paper read before the American Orthopedic Association, presented the result of some experimental work which he had done, illustrating the mechanism of this condition. His conclusions are that torsion and side flexion of the spine are parts of one combined movement, and neither exists to any extent alone. Lateral deviation of any part of the spinal column is, therefore, necessarily associated with torsion at the sight of the deviation. In flexed positions bending is associated with torsion in one direction; in extended positions, with torsion in the opposite direction. From the kind of torsion observed in scoliosis it is obvious that the deformity originates in the flexed position of the spine. Sitting in the flexed position by school-children is likely to be harmful, and sitting in a twisted position of necessity induces lateral deviation temporarily. The immediate cause of lateral deviation is, as a rule, to be found in asymmetry of development or posture which leads to oblique direction of superincumbent weight, causing the spine to deviate from the middle line.

The Treatment of Vertebral Tuberculosis, with Reference to the Forcible Correction of the Deformity.—At the annual meeting of the American Orthopedic Association² an interesting discussion on this subject took place. J. Ridlon had operated on old and on recent cases of Pott's disease. There had been 2 fatal cases. None of his patients had subsequently developed paralysis, but he had operated on several cases in which paraplegia had existed at the time. In the majority of cases he had succeeded in keeping the deformity reduced to about half of what it had been before the operation. J. E. Goldthwait stated that he would hesitate to correct forcibly any spinal deformity resulting from tuberculosis of the spine, unless it was associated with an obstinate paraplegia. He was not aware that this method of forcible correction had materially increased the mortality. Willard would resort to this method only in desperate cases of total paralysis. In one case in which he had employed it, it had proved beneficial. R. H. Sayre favored the method in severe cases of lateral curvature. He thought the amount of force applied usually to the scoliotic spine was altogether insufficient. T. H. Meyers stated that in all the 4 cases in which he had tried forcible

¹ Boston M. and S. Jour., June 14, 1900.

² Med. Rec., June 23, 1900.

correction the result had been unfortunate. Weigel thought the reports presented led one to conclude that the mechanical support used after forcible correction had been inefficient.

Brace for Lateral Curvature of the Spine.—G. D. Davis¹ presents a brace for use in this condition. It consists of an anterior and a posterior upright and a hip pad. A shoulder-piece encircles the high shoulder. The two points of support were on the arm above and on the hip below.

Observations in Lateral Curvature of the Spine.—A. M. Phelps² gives a description of a postmortem study on a severe case of rotary lateral curvature. The subject was 45 years of age. Extensive degeneration of muscles was found throughout the whole region affected. The intervertebral cartilages on the affected side were totally destroyed. He concluded that it was futile to expect to cure lateral curvature of the spine after changes in the bone had taken place.

Remarks on the Class Method of Gymnastic Treatment in Lateral Curvature.—Walter Truslow,³ at the annual meeting of the American Orthopedic Association, presented this paper, which is a review of the work and results obtained in the lateral curvature clinic at the Hospital for the Relief of the Ruptured and Crippled during the last year and a half. Of 155 cases treated, 30 have been definitely discharged—15 as cured, 14 as much improved, and 1 unimproved. Out of 82 patients who are no longer under treatment, 73 are known to have been cured or improved. The Swedish educational gymnastics were used, being well adapted for these three objects: (a) To isolate activity in groups of muscles; (b) the immediate and effectual correction of faulty positions; and (c) the development of intelligent and purposeful cooperation of the patient.

Congenital Dislocation of the Shoulder.—J. L. Porter,⁴ in reviewing the literature of this subject, found that the large majority of dislocations were subspinous. It was, in comparison with other dislocations occurring elsewhere, rather rare. Among his conclusions the author stated that, in cases determined to be developmental by the history and measurements, early operation, before the humeral head had formed a new articular facet and had itself become deformed, offered the best chances of success. In general, a successful method of treatment had not been established.

Technic of Modern Uranoplasty.—J. F. McKernon⁵ read a very interesting paper on this subject, and reports a number of cases on whom he has operated. As a preliminary to the operation we should see, in both adult and child, if any lymphoid hypertrophy exists in the pharynx or vault; and, if present, remove it prior to the operation. Enlarged tonsils should be removed if they coexist with adenoids in the child. When inferior or middle turbinated bodies encroach upon or fall into the cleft, their dependent portions should be removed. The author describes

¹ Med. Rec., June 23, 1900.

² Phila. Med. Jour., May 19, 1900.

³ Med. News, Aug. 28, 1899.

⁴ Med. Rec., June 23, 1900.

⁵ N. Y. Med. Jour., June 16, 1900.

the operation and the after-treatment in detail. Figures 85-88 show the various steps in the operation, which was performed, in this instance, to relieve a cleft in both the hard and soft palates, as well as a congenital harelip extending through the upper lip to the outer angle of the nose on the right side. Preliminary tracheotomy as an adjunct to the



Fig. 85.—Uranoplasty: After freshening edges (McKernon, in N. Y. Med. Jour., June 16, 1900).



Fig. 86.—Uranoplasty: Before suturing, showing line of incision (McKernon, in N. Y. Med. Jour., June 16, 1900).



Fig. 87.—Uranoplasty: After suturing (McKernon, in N. Y. Med. Jour., June 16, 1900).



Fig. 88.—Uranoplasty: After suturing (McKernon, in N. Y. Med. Jour., June 16, 1900).

operation is strongly advocated. The author concludes that the benefits derived from such an operation are many, and emphasizes the fact that by operation on the cases while young we insure the chances of a perfect articulation, as well as a satisfactory surgical result.

Rapid Osteoclasia for the Correction of Rachitic Deformities of the Legs.—W. Blanchard¹ claims that, when operating rapidly by

¹ Phila. Med. Jour., May 19, 1900.

this method, the circulation of the part is not impaired, and, as compared with supracondylar osteotomy, the limb was increased in length instead of being shortened. He recommends the Grattan osteoclast very highly.

Hardening Plaster-of-Paris.¹—A German patent has been granted for the treatment of plaster-of-Paris with an aqueous solution of ammonia borate. The hardening liquid may be mingled with the plaster when it is being prepared, or it may be applied to the surface of the bandages with a brush, after they have been put on. The solution is prepared by dissolving boric acid in warm water and adding thereto sufficient ammonia to form the borate which remains in the solution. The surface becomes very hard after 2 days.

Simple and Efficient Rubber Splint Shoe.—H. J. Bogardus² describes a new rubber splint shoe, which is fastened to the foot-piece of the splint by means of 2 ordinary flat-headed machine screws, which, passing through the countersunk holes in the foot-plate, engage by their threads in a piece of flat steel fitted in the slot that passes longitudinally through the rubber tire. When the screws are tightened, the rubber is brought in secure and firm apposition with the under surface of the foot-piece of the brace. It has the advantage of being less noisy, and, being more elastic, it saves the transmission of that much concussion to the patient in walking.

The Diagnostic Value of Radiography in Orthopedic and General Surgery.—L. A. Weigel³ read before the American Orthopedic Association at its annual meeting a paper in which he showed that it is possible to detect even small foci of tuberculosis of bone by the x-rays. In hip disease he finds the pelvis on the side of the lesion markedly smaller and atrophied as compared with the other side. Fractures of the neck of the os calcis were demonstrated in obscure cases. The x-rays had shown various bony lesions, such as fractures of the styloid process of the radius, a comminuted fracture of the acromion, and a fracture of the olecranon.

Hemarthrosis of the Knee.—Hibbs⁴ reports a case of two brothers with this condition. The patient when first seen had an acute hemorrhagic swelling of both knees. Bleeding had occurred from various organs at intervals of from 1 to 3 months, and with each recurrence walking was rendered impossible by the tense and painful swelling of the knees. No other joint had been affected. The synovitis caused by the hemorrhages had been prevented from resolution by their frequent occurrence. Hemophilic brothers of the patients had died in infancy.

Knee-joint Surgery Other Than in Tuberculous Processes.—J. E. Goldthwait⁵ presented a paper on this subject at the annual meeting of the American Orthopedic Association. The results were based on a study of 27 patients and 33 operations. In 5 cases both knees had been operated upon. In 8 of the cases the operation had been performed

¹ Med. News, Sept. 23, 1899.

² Med. Rec., Mar. 31, 1900.

³ Med. News, July 15, 1899.

⁴ Med. Dial, June, 1900.

⁵ Med. Rec., June 23, 1900.

because of the presence of loose cartilages, and in these the cartilages were removed. After the first week the dressing should be removed once a day, and the joint flexed, so as to prevent the formation of adhesions. The writer personally believed that there was little danger in opening the knee-joint. If there was any legitimate doubt as to the diagnosis, there should be no hesitation in opening the joint.

Internal Derangement of the Knee-joint.—Walsham¹ reports having opened the knee-joint 20 times within the last 6 years without any ill effects. He advises the following precautions: (1) Preparation of patient. It is essential that the patient should stay in bed 3 or 4 days, during which time the diet and secretions are regulated, the knee surface is rendered thoroughly aseptic, and a posterior splint is applied. (2) Arrest hemorrhage before capsule is opened and flush joint with mild boric acid solution, to get rid of all blood-clots and debris. (3) Accurately suture synovial membrane and capsule, preferably with kangaroo tendon. (4) Absolute rest of limb after operation. (5) Commence passive motion as early as fourteenth day, the patient being permitted to walk about at the end of 3 weeks.

Caput Opstipum Musculare.—M. L. Harris² reviews the literature on this subject, and presents 2 photomicrographs—the sections of an exsected muscle—showing some of the histologic changes that occur. The changes are such as are usually observed in inflammation of muscle. The transverse striæ are lost. There is round-cell infiltration. The muscle elements undergo longitudinal fibrillation and segmentation, and gradually disappear, being replaced by new connective tissue. Various stages of the process may be observed in different parts of the muscle. Starting from one or more centers, the process extends slowly, until the greater portion of the muscle often becomes involved. To this progressive feature Kader has applied the term *myositis fibrosa progrediens*. Particular attention is directed to the marked changes in the blood-cells. The vessels are surrounded by much new-formed connective tissue, which has taken the place of muscular tissue. The inflammatory changes are not usually limited to the muscle involved, but extend to and involve the muscle sheath, adjoining fascia, vascular sheath, lymphatics, etc. There is no longer doubt that the process is of an inflammatory nature. The treatment is discussed under 4 heads—mechanical, subcutaneous myotomy, Volkmann's open myotomy, and myectomy. The author's conclusions are that: (1) *Caput opstipum musculare* is a prenatal chronic inflammatory condition, due to infection, affecting principally the sternomastoid muscle, usually following an intrapartum laceration of the muscle, and accompanied by contraction; (2) the infection is primarily for a variable though considerable time progressive; (3) the best treatment is complete extirpation of the contracted muscle, with the involved surrounding tissues.

Congenital Sternomastoid Muscular Torticollis.—Kuss³ reports an autopsy and microscopic examination of the contracted sternomastoid

¹ Brit. Med. Jour., July 29, 1899.

² Medicine, July, 1899.

³ St. Louis Jour. of Med. and Surg., Sept., 1899.

in a child afflicted with congenital torticollis. He concludes that a diffuse interstitial muscular sclerosis was the cause of the atrophy and contraction. This condition was more noticeable in the latter two-thirds than in the upper third of the muscle. In the parts most affected the fibrous tissue had completely replaced the muscular tissue.

Treatment of Congenital Dislocations of the Hip.—R. Whitman,¹ before the annual meeting of the American Orthopedic Association, reports a number of cases of this condition operated upon by Lorenz's bloodless method. A large proportion of the patients were, as regards age, of the distinctly favorable type, yet but 20% were cured by this method. The writer is inclined to look upon it as a preparatory or preliminary treatment in which the process of success is dubious except in children at a very early age.

Retardation of Growth as a Cause of Shortening after Coxitis.—H. L. Taylor,² at the annual meeting of the American Orthopedic Association, read a paper with this title, which, in connection with a paper read by S. L. McCurdy, called forth a very interesting discussion. Taylor stated that in 21 cases the shaft of the femur on the affected side had been from $\frac{1}{4}$ of an inch to $2\frac{1}{2}$ inches shorter, with an average difference of $\frac{5}{8}$ of an inch. In 30 cases the average shortening on the affected side was nearly always slighter and narrower. In 26 cases there was a difference of from $\frac{1}{8}$ to $\frac{1}{2}$ of an inch in the transverse diameter of the patella. In only 1 case had there been no difference in the length of the bone, and this patient had never worn a brace. The foot was shorter in most cases. The shortening in the various bones was found to be proportionate to the duration of disability. The writer stated that careful measurements from the anterior superior spine to the knee-joint would probably show lengthening in certain of the early cases. He concluded that the shortening in the long bones of the lower extremity following hip disease of many years' standing was almost exactly the same as the shortening which followed infantile paralysis of the same duration in a series of cases. His observations seemed to show that the absence of locomotion favored the occurrence of such shortening. He fully agreed with those who attributed this retardation of growth largely to circulatory disturbances. This came in part through nervous influences and in part from mechanical compression. V. P. Gibney said that it seemed to him that there should be an elongation in hip disease, as well as in disease of the knee. Most of the investigations showed that in tuberculous knee disease the limb actually lengthened. A. M. Phelps believed that the shrinkage of the muscles was largely the result of a neurotic influence, and that, if the limb was placed at rest, the circulation would be impaired and the bone would undergo atrophy. N. M. Shaffer had found that in the cases in which the nervous phenomena had been most marked, especially in the dry cases, the shortening had been proportionately greater than in those even in which suppuration had been present. R. H. Sayre had noticed, in cases in which the use of apparatus had been discontinued from one limb a considerable time

¹ Practitioner, Mar., 1900.

² Med. Rec., June 23, 1900.

before the other, when both were affected, an increase in the limb first liberated. Galloway observed that in knee disease two epiphyses were subject to stimulation—the lower end of the femur and the upper end of the tibia. In a series of cases measured by Goldthwait practically all shortening had taken place below the knee. Ridlon thought that muscular shrinkage was not always associated with intense reflex spasm.

The Neuromuscular Element in Hip-joint Disease, with Special Reference to the Question of the Abolition of Protective Treatment.—N. M. Shaffer¹ read a paper on this subject before the Orthopedic Section of the New York Academy of Medicine. He defines the reflex muscular condition present in hip disease as an involuntary tonic muscular contraction, tetanoid in character, having its origin in nerve irritation caused by intra-articular pressure. It is characterized by a specific muscular atrophy and a reduced faradic reaction of the muscles affected. The author calls attention to the expressive character of this tetanoid spasm in joint disease, as forming the only reliable sign in both diagnosis and treatment, and its presence is of the greatest significance, whether in the first or in the last stage of the disease. As the results of further observation and experience, he is enabled to emphasize a statement made in 1891,² that, in all but the exceptional cases, a relapse as to deformity or as to the disease, or both, is likely to occur as the result of the traumatism of ordinary locomotion, unless the proper mechanical protection is maintained until the articulation is free from true reflex muscular spasm or is ankylosed.

Certain Aspects of Bone and Joint Disease of Interest to the General Practitioner.—V. P. Gibney,³ before the New York Academy of Medicine, read a paper in which he called attention to certain aspects in bone and joint diseases which specially appeal to the practitioner. The writer also emphasizes the importance of an early diagnosis in all diseases that end in deformity, an early diagnosis of all injuries that end in disease, and a study of all points in differential diagnosis.

Treatment for Congenital Misplacement of Hip.—H. E. Reeves,⁴ at a meeting of the British Orthopedic Society, showed an improvement on an instrument for the ambulatory treatment of this condition. This instrument kept up extension while the patient walked about. It allowed flexion at the knee and abduction at the hip. The latter could be fixed at any desired degree of abduction, and the former in full extension.

A Treatment for Acute Serous Synovitis Permitting of Joint Functions.—P. Hoffmann⁵ emphasizes the value of a method which he has successfully employed since October, 1895, in the treatment of this condition. Its application is quite simple, though considerable care and judgment should be exercised. The principle is to fill all depressions about the joint with cotton, and then to apply strips of adhesive plaster

¹ N. Y. Med. Jour., April 14, 1900.

² N. Y. Med. Jour., Nov. 28, 1891.

³ Med. News, Oct. 28, 1899.

⁴ Brit. Med. Jour., Nov. 18, 1899.

⁵ N. Y. Med. Jour., Jan. 27, 1900.

in such a way as entirely to encircle the joint and several inches of the limb above and below it, so as to make firm and equable compression. He has treated 156 cases of synovitis by this method, and the majority of the results obtained have been gratifying.

Sudden Dislocations in Hip Disease.—Kirmisson¹ states that this condition sometimes, but rarely, occurs in the course of the disease, before extensive destruction of the joint surface has occurred, and usually without suppuration. It differs from the luxation due to erosion of the femoral head and acetabulum the result of prolonged disease. Owing to the slight joint changes, reduction under an anesthetic is usually possible and is permanent.

Tuberculous Disease of Joints.—A. E. Maylard² unhesitatingly advocates erosion in preference to excision in children, in every joint where it can be executed. A study of 26 cases collectively brings out the remarkable fact that in not a single instance was the growth of the limb interfered with by erosion, while varying degrees of shortening followed in every case of excision. In 2 cases of excision of the elbow where there was good flexion and extension, the hand of the affected side was markedly diminished in size, while in the only 2 cases of erosion in which it was noticed, where there was complete ankylosis at the joint, the hands were practically the same in size on both sides. If this lack of development be due to functional inactivity, it would seem to indicate that an eroded, ankylosed elbow gave a more serviceable and useful limb, on the whole, than an excised, movable one; that a patient is able to make much more use of the hands in the former case than in the latter. The writer's conclusions are based on the comparative results of excision and erosion which have been observed from 2½ to 12 years after operation, the ages of the patients ranging from under 2 to over 13 years.

Rheumatic Joints Treated by Hot Air.—Homer Gibney³ reports a number of cases which have done well under this method of treatment. He concludes that superheated air does not always give the desired result in the treatment of rheumatic joints. It is sometimes indicated as an adjuvant.

Irritation Exostoses of the Human Foot.—E. H. Bradford,⁴ at the annual meeting of the American Orthopedic Association, called attention to the fact that under certain circumstances of irritation bone will become thickened, very much as callosities of the skin will develop under the same condition; and the situations in the foot where this has taken place are those exposed to pressure from shoes in walking. The parts where the enlargement takes place are necessarily the parts most exposed to pressure, and these are in the portions of the foot where the strain is greatest and where the bone is the least protected by fat. The writer presents some excellent skiagraphs, showing the places where these bone irritations most commonly occur.

¹ Rev. d'Orthop., Jan., 1899.

² Med. News, July 21, 1900.

³ Practitioner, Sept., 1899.

⁴ Phila. Med. Jour., July 29, 1899.

Congenital Club-foot.—H. L. Taylor¹ advocates a brace with a steel sole-plate and inside upright bar, with a screw-stop at ankle by means of which the equinus deformity may be corrected. In other cases the tendo Achillis or the plantar fasciæ, one or both, is divided and the foot put up at once in an overcorrected position, after which the mechanical treatment is continued for a long time. The writer has found this means sufficient to correct nearly all his cases under 6 years of age.

Tabetic Club-foot.—Schulz² reports an interesting deformity which was present in tabes dorsalis, and which is extremely rare. The patient, a man 33 years old, gave a history of syphilis 12 years previously. The condition of club-foot had been present for 6 years. A skiagraph showed that the joint between the astragalus and the os calcis, as well as that between the scaphoid and cuboid, was almost completely obliterated, while that between the cuboid and the external cuneiform and the heads of the last two metatarsal bones was represented by a compressed mass without indication of an articular line. The cuboid bone seemed to be fractured, and the fissure appeared to extend between the scaphoid and the internal cuneiform bones. In some cases of tabetic club-foot it is possible that, as a result of disturbances in the nutrition of the bones of the foot, these bones are rendered somewhat fragile, and are readily fractured through the weight of the individual.

Hallux Valgus and Varus.—At the meeting of the British Orthopedic Society, in a discussion³ on this subject Jackson Clarke stated that he considered congenital cases of hallux valgus to be due to intra-uterine pressure. The more severe cases of acquired hallux valgus were due to the combined action of a predisposing and an exciting cause. The speaker believed that every case of hallux valgus was curable. Robert Jones thought the extensor of the great toe generally needed division in hallux valgus. Tubby thought that 90% of the cases were due to rheumatoid arthritis. If enough bone were removed, there was no need to divide the extensor tendon. Little stated that many cases of considerable valgus deformity caused no symptoms without arthritis. Noble Smith said that in the milder cases much could be done by persuading patients to wear properly adjusted boots.

Lengthening the Tendo Achillis.—R. A. Hibbs,⁴ at a meeting of the Orthopedic Section of the New York Academy of Medicine, presented 5 patients affected with equinovarus, the result of infantile paraplegia. He describes an operation for lengthening the tendo Achillis. The tendo Achillis having been exposed by a parallel incision $1\frac{1}{2}$ inches in length, made to its outer side, it was cut transversely within $\frac{1}{2}$ of an inch of its insertion through two-thirds of its substance, and with the turned knife it was then split upward a certain distance. At a distance of $\frac{1}{4}$ of an inch above the end of the longitudinal cut another transverse cut was made from the opposite side through two-thirds of the substance

¹ Canad. Pract. and Rev., Dec., 1899.

² Berl. klin. Woch., May 28, 1899.

³ Brit. Med. Jour., Mar. 3, 1900.

⁴ Med. News, April 21, 1900.

of the tendon, and, the knife being turned, the tendon was again split to within $\frac{1}{4}$ of an inch of the first transverse incision. Thus the tendon was severed in such a manner as to secure its lengthening, and at the same time to preserve its continuity. In none of the writer's cases had an effort been made to correct the equinus beyond a right angle. Further correction might be desirable in a congenital but not in an acquired case. He stated that the strength of a tendon lengthened in this way is not seriously impaired. The process of repair had been rapidly complete after operation by this method. [We can see no advantage in the new operation over the ordinary subcutaneous method, after which many cases acquire a lengthening of $2\frac{1}{2}$ inches, but the author should be congratulated on the results obtained in the cases which were shown.]

Modern Foot Clothing.—Mosher¹ calls attention to the importance of proper foot clothing for the foot before its maturity, when it makes its real growth, and when most of the damage is done which results in so much misery in after life, such as callosities, flat-foot, etc. The cardinal point in building shoes is the straight inside foot line. The sole of the shoe should always be wider than the corresponding part of the foot, and the tracing of the foot should always be made with the weight of the body on the foot. The shoes must be right and left, even in infancy, and should be laced. The heel should be broad and low. The author advocates having a custom last maker, who will make a last after a plaster-of-Paris cast of the foot, intelligently correcting the imperfections. Stockings should be of good, firm material, soft and pliable, always rights and lefts, and better digitated for at least the great toe, if not for all the toes. The writer urges the medical profession to pay more attention to the proper foot clothing, in that it adds to the health and comfort of the community.

¹ Brooklyn Med. Jour., Nov., 1899.

OPHTHALMOLOGY.

By HOWARD FORDE HANSELL, M.D., AND WENDELL REBER, M.D.,

OF PHILADELPHIA.

LIDS.

Symptomatic Blepharitis.—In a number of cases of blepharitis that did not yield to the usual medication Winselman¹ noticed that the lid trouble disappeared soon after the correction of optical errors. [It is a matter for sincere congratulation that our German brethren have at last discovered that uncorrected optical defects are the usual cause of chronic inflammation of the lid margins. We say "discovered," for, so far as the Germans are concerned, the lesson has been taught them by their own experience and not by the earnest teaching of American ophthalmologists, who have insisted for years on this causal relation between eye-strain and blepharitis.]

Intrinsic Blepharitis.—For that type of blepharitis presenting eczematous inflammation of the lid surfaces as well as their margins, and that are independent of eye-strain, S. Stephenson² finds nothing equal to 10% protargol ointment, freely applied at night after the crusts have been removed from the surfaces of the lids and their margins.

Blepharospasm.—Pes³ reports 2 cases of chronic recurrent blepharospasm which were permanently cured by resection of the external nasal twig of the first branch of the fifth nerve. His modification of the usual operation is to introduce a metallic seton beneath the skin and those fibers of the frontalis muscle that take part in the spasmodic contraction. This seton is allowed to remain *in situ* for about 15 days after the operation.

Rodent Ulcer.—Kenneth Scott's case⁴ of destructive ulceration of the lid, seen in a man of 45, shows how difficult it sometimes is to distinguish between malignant ulcer and the ulcer of masked tertiary syphilis. In this particular case mercurial injections quickly healed up the entire ulcerous area, which was quite extensive. [The lesson is obvious. An ulcerous condition of the skin about the eyes concerning which there is the least doubt should be subjected to just such medication as in the foregoing case.]

New Growths.—The features of plexiform neuroma of the eyelid are described by H. Friedenwald.⁵ It is, strictly speaking, a fibroma

¹ Klin. Monatsbl. f. Augenh., July, 1900.

² Ann. di ottal., XVIII, Nos. 3 and 4.

³ Johns Hopkins Hosp. Rep., vol. III, p. 9.

⁴ Ann. Ophth., July, 1900.

⁵ Ann. Ophth., Jan., 1900.

PLATE 7.



Plexiform neuroma of the eyelid (Friedenwald, in Johns Hopkins Hosp. Rep., vol. III).

developed from the sheaths of the peripheral nerves. The lid becomes swollen and droops, generally shows pigmentation, and is compressible. In its later stages its appearance is that of elephantiasis. It will be found that the tumor contains deep corded masses that run back into the orbit, and that it is made up of masses of connective tissue in concentric layers along with nerve-fibers that are usually degenerated. The growth is apt to recur even after the most painstaking enucleation.

CONJUNCTIVA.

The Conjunctival Sac as a Portal of Infection.—From Römer's ¹ experimental studies we learn that in the case of the rabbit and the guinea-pig the conjunctival sac is an extremely dangerous route of general infection, as dangerous as, if not more so than, most all other recognized routes. The germs do not enter the general circulation by way of the conjunctiva itself. Römer shows that fine corpuscular elements, such as powdered carmin, dropped into the conjunctival sac, reach the nose by way of the tear-duct, and are then taken up by the epithelium of the nasal mucous membranes and deposited in the submucous lymphatics. Hence, in general infection from the conjunctiva the nasal mucosa is, strictly speaking, the entrance point. He insists that, because of these facts, dust, which easily finds lodgment on the conjunctiva, is etiologically important.

Out of 669 cases of **phlyctenular conjunctivitis** S. Stephenson ² found 53 % coincident with eczema on some other part of the body, from which he concludes that phlyctenular conjunctivitis is an ocular eczema. [Last year we pointed out this same connection, and showed the value of ichthyol in the treatment of ocular as well as cutaneous eczema.] In one month 18 cases of acute granular conjunctivitis—males, from 14 to 20 years of age—sought treatment in the clinic of P. Schultz,³ of Berlin. The cause of the infection was traced to a bath establishment. The mode of the infection was uncertain, but was thought to be either by direct contact of an infected with a healthy individual, or by the air or the water of the bath.

Mucopurulent Conjunctivitis.—In any mucopurulent phase of any conjunctival inflammation F. Doxenberger ⁴ pencils the retrotarsal folds of the conjunctiva with 5 % to 10 % solutions of argentamin or orders daily instillations at home of a 3 % solution. The results obtained have been highly satisfactory. Emmert ⁵ used protargol in 1 % to 3 % solution in 350 cases of mucopurulent conjunctivitis. He also bandaged the eyes at night after using 5 % to 20 % protargol and vaselin. This is spread on soft linen rags and laid over the lids. The protargol seems to work its way into the conjunctival sac if a little pressure is used with the bandage. Simple cases were relieved in from 2 to 3 days, while the severer cases lasted from 5 to 8 days. E. Gutt-

¹ Zeit. f. Hyg. u. Infektionskr., xxx, 295.

² Oph. Rec., Oct., 1900.

³ Berl. klin. Woch., Sept. 25, 1899.

⁴ Woch. f. Ther. u. Hyg. des Aug., Oct. 4, 1900.

⁵ Lancet, Aug. 14, 1899.

mann¹ prefers 2 or 3 drops of a 15 grains to the ounce solution of mercuric chlorid in the severer forms of mucopurulent conjunctivitis. This solution is applied once daily to the conjunctiva and the lids, carefully avoiding the cornea. [For a disorder that yields so readily to much milder remedies, this treatment seems unjustifiably harsh.] S. Stephenson² paints a 10% to 20% protargol solution directly on the conjunctiva, but finds it inferior to weak zinc chlorid solution in the milder forms of this disorder.

Purulent Conjunctivitis.—No little interest attaches to the report of P. Haglund,³ who found *Diplococcus intracellularis meningitidis* (the meningococcus) in the conjunctival secretion of a boy who lost his eye from a very severe purulent conjunctivitis of obscure origin, at first thought to be gonorrheal. It was later found to be really due to the foregoing micro-organism. W. R. Murray⁴ reports a case in which a patient who was suffering from an attack of specific urethritis communicated this infection to his right orbital cavity (which was empty) by fingering his artificial eye carelessly. In two cases of severe gonorrheal conjunctivitis of 24 hours' duration, F. Buller⁵ anesthetized the patients, did external canthotomy, washed every portion of the conjunctiva with 1:2000 mercuric chlorid solution, and then, protecting the cornea with vaselin, freely swabbed the entire conjunctiva with a 40 grains to the ounce silver nitrate solution. At the end of 24 hours there remained only a mucopurulent conjunctivitis, which ran a mild course without any destructive corneal ulceration. [This may seem like heroic treatment, but nothing is too heroic that will save useful vision to an eye that is the seat of true gonorrheal conjunctivitis.] Lor⁶ says that with a 5% or 10% solution of protargol, purulent conjunctivitis can not be checked even if the treatment is instituted early. Protargol, however, has a tremendous advantage in its painlessness.

Purulent Conjunctivitis of the New-born.—E. L. Gault,⁷ in speaking of the prognosis of *ophthalmia neonatorum*, says that no eye should suffer from permanent corneal opacity, nor should there be failure to obtain complete recovery if the case is properly treated from the first. [This statement is discouraging to those of us who by every means in our power, and by constant attention by physicians and capable nurses, have failed to save eyes. Local treatment is exceedingly important, but often fails with puny, prematurely born, and unusually weak babies, and this is true in both hospital and private practice.] Nedden⁸ records an instance of apparently classic purulent conjunctivitis of the new-born due entirely to the action of the pseudobacillus of influenza, and urges that infants are peculiarly susceptible to infection by this organism. The treatment was that of classic *ophthalmia neonatorum*. Engelmann⁹ pronounces a 20% solution of protargol practically nonirritating to the conjunctiva of the new-born. In the

¹ Deut. med. Woch., No. 44, 1899.

² Klin. Monatsbl. f. Augen., Beilageheft, 1900.

³ Ann. Ophth., July, 1900.

⁴ Intercol. Med. Jour., Dec. 20, 1899.

⁵ Klin. Monatsbl. f. Augenh., Mar., 1900.

⁶ Ann. Ophth., July, 1900.

⁷ Oph. Rec., Feb., 1900.

⁸ Rev. Gén. d'oph., July 21, 1899.

⁹ Centralbl. f. Gyn., Nov. 9, 1899.

treatment of infantile purulent conjunctivitis it is a better agent in every way than silver nitrate. Friedenwald,¹ on the other hand, believes in silver nitrate, usually in 2% solution. It is not to be dropped into the conjunctival sac, as is frequently done. He believes more in continuous cold until the secretion becomes markedly purulent. Emmert² gives the preference to protargol, claiming that severe cases recover in from 6 to 18 days, with ice compresses to assist the recovery. He believes in protargol instead of silver nitrate as a prophylactic in the lying-in hospitals.

Trachoma.—W. M. Cowgill³ says the negro does not suffer from trachoma because it is a contagious disease, and because he does not come in contact with the contagion—that is to say, the whites. In western Kentucky the author found trachoma extremely uncommon among the better-class whites, but quite common among the poor whites. In an experience covering 1500 cases of trachoma, A. Schiele⁴ found iodic acid 15 parts, gum-camphor 1 part, in stick form, to be the most effective remedy. Under cocain the trachomatous areas were touched everywhere with this stick. His principal claim is that this treatment leaves no scar. Iodic acid in 5% solution he has used in all forms of trachoma, applied carefully with a camel's-hair brush. The average time of recovery was from 2 to 3 months. J. Masselon⁵ deplors the fact that the jequirity treatment has lost many followers in the last few years. According to his results, **jequirity** should be used only when there is no secretion along with the granulation, but it is particularly beneficial in such selected cases. He applies the powdered drug to the eye just as calomel is used, allowing it to remain in contact with the tissues for from 2 to 5 minutes according to the reaction desired. Contrary to the method employed by Sweet,⁶ Masselon believes one pronounced jequirity reaction is more likely to do good than several weak ones.

T. D. Myers⁷ has practically abandoned copper and silver in the office management of chronic granular disease of the eyelids, using **electrolysis** instead in a current of from 1½ ma. to 2 ma. strength. Under cocain, 3 or 4 punctures are made in each follicle, the needle remaining in the tissues until the appearance of small, pasty, white masses about its point of entrance show that the tissues are pretty well disintegrated. He claims that the contents of the granule are thus destroyed without loss of the conjunctival epithelium; hence no scar tissue follows, as is often seen after the use of the flat electrode. He claims that the method is clean, precise, and effective, and he has never seen any pronounced reaction, although he has treated hundreds of cases. [It is unfortunate that he gives no definite statement of results.] H. Adler's⁸ treatment is (1) medicinal, (2) mechanical, and (3) operative. He likes antiseptics in the early stage and esteems copper as very important later.

¹ Maryland Med. Jour., Sept. 30, 1899.

² Lancet, Oct 14, 1899.

³ Jour. Am. Med. Assoc., Feb. 17, 1900.

⁴ Centralbl. f. prakt. Augenh., April and May, 1900.

⁵ Die ophthal. Klin., May 20, 1900.

⁶ YEAR-BOOK, 1899.

⁷ Oph. Rec., Jan., 1900.

⁸ Wien. med. Presse, Feb. 11, 1900.

Pannus of trachoma, disappearing after facial erysipelas, is recorded by G. Buck.¹ The patient, a girl, had been through all the routine treatment for trachoma with but slight improvement. Erysipelas developed without any apparent cause, and so involved the lids that they could not be opened. Fourteen days later the pannus had almost entirely disappeared and the cornea had cleared to a remarkable degree. The author holds that the erysipelas toxins gained entrance to the lymph-channels, and that they caused the disappearance of the pannus. The value of well-directed, prolonged, and energetic hygienic measures in the stamping out of trachoma is shown by S. Stephenson² in the history of the Hanwell School of London. The most effective measure was the erection of the ophthalmic isolation school, to which all trachoma cases were transferred, and the remodeling of the old buildings.

Diphtheric Conjunctivitis.—S. Stephenson's³ routine bacteriologic examination of all doubtful cases of conjunctivitis is a little startling in its showing that 2% of all cases of conjunctivitis were diphtheric. However, Stephenson does not limit the name diphtheric conjunctivitis to the severe cases described by v. Graefe, but includes all cases showing conjunctival membranes in which the Klebs-Loeffler bacillus is found. "Croupous is an ambiguous term that should be dropped. Cases should be classed as interstitial, superficial, membranous, and catarrhal. The remaining forms of conjunctivitis would naturally be classed according to the micro-organisms present, such as pneumococcus, etc." He urges antitoxin injections in all suspected cases without waiting for the bacteriologic verdict. Locally he uses 15% potassium permanganate solution on the conjunctiva once daily with some weak antiseptic solution for frequent cleansing. H. Coppez⁴ emphasizes the fact that because of the almost constant presence of *Bacillus xerosis*, the diagnosis of ocular diphtheria bacteriologically is much more difficult than diagnosing the usual variety. He has noticed that the cornea is not affected if its epithelium remains intact, and hence advises frequent anointing of the conjunctiva, and of the cornea in particular, with vaselin.

Tuberculosis.—J. H. Eyre⁵ believes the relative frequency of tuberculosis of the conjunctiva has been underestimated. In a close study of 31,000 clinical cases he found some form of conjunctival tuberculosis in the proportion of 1 to 2700. As to the microscopy of the disease, in the case of ulcer tubercle bacilli can generally be demonstrated by suitable means in the "scrapings"; but when granuloma is the lesion, it is rather the exception than the rule to detect the organisms in sections of the tissues. In the latter case inoculation experiments should be done. He advises thorough removal of either the granuloma or ulcer as early as possible, in which case a permanent cure may be expected. In this connection should be mentioned H. Kuhnt's case⁶ of conjunctival and corneal tuberculosis, in which the diagnosis

¹ Klin. Monatsbl. f. Augenh., Feb., 1900.

² Lancet, Feb. 17, 1900.

³ Knapp's Arch. of Oph., Jan., 1900.

⁴ Arch. Oph., July, 1900.

⁵ Arch. d'Oph., Oct., 1899.

⁶ Zeit. f. Augenh., Feb., 1900.

was confirmed by inoculation experiments. After 2 months of unavailing treatment facial erysipelas appeared and persisted for 4 weeks, at which time the tuberculous deposit had almost entirely disappeared. Iodoform massage completed the cure. F. C. Hotz¹ also has seen a case in a child of 5. The clinical picture was quite complete, and the diagnosis was clinched by bacteriologic examination.

Pemphigus.—J. V. Michel's² study of 6 cases of conjunctival pemphigus shows that systematic investigation of the mucous membranes and skin will usually disclose indications of pemphigus in all cases of adhesion of the conjunctiva not attributable to caustics, trachoma, or diphtheria. It may appear first in one eye, becoming bilateral later. The prognosis is almost invariably bad, as medication is without avail, and all the plastic operations so far tried have not arrested the process.

Pterygium.—Weymann³ advises the removal of all pterygia whether progressive or not. The methods for the destruction of the head may vary, but they should all secure thorough and smooth removal, be entirely free from danger, and cause sufficient plastic reaction to result in a firm scar. He prefers a very thin galvanocautery knife for such work.

Foreign Body.—H. F. Hansell⁴ records a case of foreign body in the conjunctival sac that is unique because of the size of the foreign body and because of the complete recovery of the eye without symblepharon. The cast was of hot congealed solder (1 part tin and 3 parts lead) and measured $1\frac{1}{2}$ cm. by 1 cm. It was still so hot when it entered the conjunctival sac that it took on the shape of the upper sulcus of the conjunctival sac. The treatment consisted in instillations of atropin, fluid vaselin, and the application of iced water compresses. To prevent attachments, oil was injected frequently into the superior culdesac and the lid was separated from the ball many times daily.

LACRIMAL APPARATUS.

Donald Gunn⁵ finds lacrimal troubles most frequent in women past middle life and in young children. In the former, when there is no nasal disorder, there is no obvious cause for the lacrimal trouble. Parental syphilis is the commonest cause of lacrimal disturbances in children; hence the unsatisfactory results usually obtained. In the discussion on **lacrimal obstruction** before the British Medical Association, G. A. Berry⁶ deplored the tendency to overtreat this condition. This, he thought, was due to the common belief that the cause was obstruction, whereas it is really catarrh of the duct. He preferred slitting of the upper canaliculus and inserting small probes at long intervals as the after-treatment. Cartwright⁷ said that he avoided as far as possible all slitting of the ducts, as it caused needless damage and im-

¹ Jour. Am. Med. Assoc., Jan. 20, 1900.

² Jour. Am. Med. Assoc., Sept. 15, 1900.

³ Oph. Rev., Feb., 1900.

⁴ Derm. Zeit., Aug., 1900.

⁵ Phila. Med. Jour., Aug. 4, 1900.

⁶ Oph. Rec., Oct., 1900.

⁷ Oph. Rec., Oct., 1900.

paired their function. He often found syringing with antiseptics and astringents useful. In cases of chronic inflammatory thickening Kenneth Scott¹ could hardly condemn large probes enough. Bower² and Cross,³ too, saw no special advantage in them. S. Stephenson,⁴ on the other hand, was convinced that in difficult cases nothing was so effective as large probes, his preference being for Theobald's instruments, carrying them up to that 4 mm. in diameter. As to **dacryocystitis**, it seemed to be the general verdict that free incision and after-treatment by probing was the only rational thing to do. For washing out the sac in such cases, S. Stephenson⁵ has found 5% to 10% solutions of protargol superior to anything he has yet used. The most beneficial measure in handling **lacrimal stricture** is electrolysis, according to L. L. Mial.⁶ It is not necessary to slit the canaliculus, as a fine conic electrode can be passed through the punctum in almost every instance. [The author claims that electrolysis opens the passages and keeps them open speedily, painlessly, and without hemorrhage.] The current should not exceed 3 ma., with the posterior pole at the back of the neck. Frequent sittings of less than 2 minutes' duration are advisable. In **extirpating the lacrimal sac**, Czermak⁷ advises that the external opening be made as small as possible, never more than 1 cm. in length, the incision extending down and out from a point corresponding to the juncture of the ligament with the orbital margin, care being taken to leave the tarsal ligament undivided. He believes in the operation as a last resort in intractable lacrimal disorders.

ORBIT AND ACCESSORY CAVITIES.

"Intranasal operation for frontal sinus disease," says R. Sattler,⁸ "is generally productive of little or no good, and is, in addition, unsurgical and dangerous." He thoroughly exposes and explores the sinus from without, and if wide-spread malignant disease of the communicating cavities is not found, always tries to reopen communication with the nose through the natural channels. The after-treatment should be like that of any other bone cavity. **Retrobulbar abscess** is recorded by J. Guttmann.⁹ It was apparently an extension from an empyema of the antrum and ethmoid cavities following dental caries. He attributes the cure in his case entirely to the exploration and treatment not only of the orbital trouble, but also of the accessory cavities and sinuses. **Osteoperiostitis** of nasal and ethmoidal origin is of common occurrence. The lid becomes red and swollen and a small tumor soon forms at the inner angle of the orbit, disappearing later, only to return after some weeks or months. If this swelling is incised, blood only escapes—pus never. Chauvel¹⁰ says that the proper treatment in such cases is not incision, but measures directed to the nasal and ethmoidal conditions, to which must be added proper constitutional remedies. E. Neese¹¹ gives, as the

¹ Oph. Rec., Oct., 1900. ² Ibid. ³ Ibid. ⁴ Ibid. ⁵ Ann. Ophth., July, 1900.

⁶ N. Y. Med. Jour., Oct. 20, 1900.

⁷ Zeit. f. Augenh., Supplement, 1900.

⁸ Ann. Ophth., April, 1900.

⁹ Ann. Ophth., Jan., 1900.

¹⁰ L'Acad. de Med., Dec. 19, 1899.

¹¹ Arch. Oph., Jan., 1900.

important signs of **cavernous orbital angioma**, painlessness, exceeding slowness of growth, preserved motility of the eye, elastic consistency and compressibility of the tumor, and, above all, a tendency to swell under the influence of venous stasis. C. S. Bull's ¹ cases of **vascular tumors of the orbit** teach (1) that the administration of ether causes an unusual dilation not only of the vessels composing the tumor, but of those in its neighborhood, and prohibits operation, and that hypodermic injection of cocain gives sufficient anesthesia; (2) that in traumatic pulsating orbital tumor ligation of the common carotid did not bring about a perfect cure; (3) that a nontraumatic pulsating tumor may terminate in spontaneous recovery. When it becomes advisable in diseases of the frontal sinus encroaching upon the orbit to open a communication between the two cavities, G. C. Harlan's experience ² leads him to prefer the upper inner angle of the orbit, because the bone is thinner in this position and more likely to be diseased, and treatment of the ethmoid cells, which are so often involved, becomes easy, and, again,—a matter of no slight importance,—the scar becomes almost invisible as time goes on. Malignant disease or orbital cellulitis was suspected in a patient of R. Sattler's ³ 16 months old. It was probably caused by a purulent ethmoiditis due to the migration of pyogenic bacteria from the nasal or more remote mucous surfaces. Gentle manipulation of the swelling over the frontal sinus caused disappearance of the tumor by forcing its contents through the ethmoidal cells into the nostril. His case of **leontiasis ossea** is of interest because the clinical observations were succeeded by necropsy. The bony enlargement was first noticed in the upper facial region of the left side, at 11 years of age, and proptosis and epiphora were present from the start. Death ensued at the age of 21. "The brain was compressed and the superficial veins were prominent and varicose. The body of the sphenoid had undergone great rarefaction. The sella turcica was very deep. The pituitary gland was much enlarged, but presented no gross lesion. The bony framework of the skull had undergone excessive overgrowth. The sinuses were greatly contracted or altogether filled up. The cause of death was hemorrhage at the base of the brain."

CORNEA.

Ulceration.—Under the title of *keratitis ulcerativa marginalis*, W. A. Martin ⁴ describes a superficial infiltration occurring in small spots distributed about the margin of the cornea. These spots soon lose their epithelium and form small ulcers arranged around the limbus, appearing first in one eye and then in the other. They usually continue about a week. Martin believes that there is a chain of lymph-spaces underlying the cornea at these points, and that the infection travels along these channels. He treats the disease with 1 : 7500 mercuric chlorid solution and calomel by insufflation. G. P. Head ⁵ speaks of corneal ulcer as a com-

¹ Tr. Am. Ophth. Soc., 1900.

² Tr. Am. Ophth. Soc., 1900.

³ Tr. Am. Ophth. Soc., 1900.

⁴ Oph. Rec., Aug. 1, 1900.

⁵ Jour. Am. Med. Assoc., Mar. 17, 1900.

plication of chicken-pox occurring in a 1-year-old infant. Although the trouble was of but few days' duration, the sight of the eye was practically destroyed. There was no history of injury or of previous disease. Several of the family, including the infant, had had chicken-pox—all of them mild cases. None of them had ever been vaccinated. There was an epidemic of varicella in the community at the time, but no question ever arose as to the disease being other than chicken-pox. The general principles underlying the management of corneal ulcers are considered by Tennant¹ to begin with a mercurial, to be followed by tonics and reconstructives. In children and in most adult cases internal medication is more important than local measures. The latter consist in absolute cleanliness, relief of pain, mild astringents, scraping, with the use of stronger astringents, and finally cauterizing. A. Schiele² dusts iodogallicin directly into the eye in corneal ulcer. This remedy has the composition of bismuth 38.4 parts and iodine 23.6 parts. He attributes the favorable influence of this drug in corneal ulcer to the drying effect it has on the floor of the ulcer, and also to its antiseptic qualities. Amata³ is convinced that the subconjunctival injection of sublimate surpasses all other methods of treatment for corneal ulcers in simplicity and efficiency. In all but one out of 42 cases, one injection was sufficient and effected a cure. Bourgeois⁴ sterilizes infectious ulcers of the cornea with the thermocautery, or, better still, with plain hot water. For dendritic rodent ulcers H. Friedenwald⁵ recommends applications of tincture of iodine. He has employed it in this way in 25 cases, and has been abundantly satisfied with it. [We have been using this remedy for some time, and find no reason to substitute other methods for it. In necrotic keratitis associated with purulent ophthalmia the recovery in apparently hopeless cases is remarkable.] For this same form of rodent, indolent, and phagedenic ulcers of the cornea F. B. Tiffany⁶ speaks in warm terms of the **electrocautery**. He feels that the results thus obtained are vastly superior to any drug results he has seen. F. Cornwall⁷ has been successful in such cases with **electrolysis**. The voltage must be very low, the amperage not more than 0.25 ma. With the aid of the magnifying glass the parts are lightly touched with the end of the needle while the other electrode is placed upon the cheek. H. Gradle⁸ believes that scrofulous superficial keratitis occurs only in individuals who are under the influence of toxins produced by the tubercle bacillus in the lymph-system. In 4 cases he used tuberculin for diagnostic purposes, and each time secured a positive febrile reaction. He recommends sodium salicylate in 15- to 20-grain doses every 2 hours for adults. Five instances of interstitial keratitis occurring in acquired syphilis are brought to light by J. P. Lawford.⁹ They conform to what is now accepted as the usual clinical picture,

¹ Jour. Am. Med. Assoc., Sept. 15, 1900.

² Centralbl. f. prakt. Augenh., April and May, 1900.

³ Gaz. degli Osped., Feb. 25, 1900.

⁴ Tr. Am. Ophth. Soc., 1900.

⁵ Arch. Oph., Jan., 1900.

⁶ Ann. d'ocul., Oct. 7, 1899.

⁷ Jour. Am. Med. Assoc., Feb. 24, 1900.

⁸ Oph. Rec., July, 1900.

⁹ Brit. Med. Jour., Oct. 28, 1899.

in that but one eye was affected, instead of both, as in the hereditary form.

IRIS.

Atrophy.—Exfoliation of the iris is by no means frequent. In a case that he had under observation for some weeks, E. Jackson¹ watched the pigment absorption process extend from week to week. (Fig. 89.) This pigment absorption was associated in this case (as in the other cases reported) with increasing loss of transparency of the lenses. [The choroidal pigment atrophy of advanced age is probably analogous to the pigment absorption in the foregoing case.]



Fig. 89.—Exfoliation of the iris (E. Jackson, in *Oph. Rec.*, Aug., 1900).

Iritis.—Iritis may sometimes go unrecognized in elderly people, as pointed out by A. B. Hale.² He has noticed it in cases of what was apparently acute catarrhal conjunctivitis. The inflammation of the iris is unsuspected because the pupil reacts and the iris is not discolored. The true condition of things is learned only by the use of atropin. He calls the disease "iritis senum." Another unusual phase of iritis is that form due to dental irritation. B. L. Millikin³ gives the full details of an undoubted case. The patient suffered an attack in each eye at intervals of 2 months, and in both attacks there was a history of toothache. The iritis subsided in both instances as soon as the dental irritation was relieved. The writer does not believe there was any possibility of septic infection, but considers it an example of true reflex irritation. N. B. Jenkins⁴ finds hot footbaths, salts, Epsom salts, and small doses of calomel serviceable in nearly all cases of iritis. Constitutional treatment is, of course, always in order. The local treatment consists in placing the patient in a darkened room, atropin, and hot applications as many times daily as is necessary for the comfort of the patient, and corneal puncture in certain cases. If but one eye is affected, a drop of a 1:5000 solution of atropin should be put in the sound eye once daily to lessen the chances of involvement of that eye. He makes the startling statement that "the less atropin used, the greater the likelihood of saving such eyes in the aged." [While atropin has its dangers after 45, iritis always establishes a tolerance of the eye to this drug, so that such precautions as the foregoing are entirely unnecessary.] For congestion and pain he recommends a compress of 1:5000 solution of mercuric chlorid, as hot as can be borne, for half an hour several times a day. Brunson⁵ found 48 cases of iritis in 1500

¹ *Oph. Rec.*, Aug., 1900.

² *Jour. Am. Med. Assoc.*, June 30, 1900.

³ *Arch. Oph.*, Mar., 1900.

⁴ *N. Y. Med. Jour.*, Feb. 24, 1900.

⁵ *Oph. Rev.*, Nov., 1899.

syphilitics and 23 in 1500 rheumatics. He asserts that if heroic treatment is given to a syphilitic when the initial lesion is first seen, iritis will not occur once in 500 cases. In the differential diagnosis he calls attention to the papules on the iris with their varying color, and to the frequency of hypopyon in syphilis. In rheumatism the exudation is less and the photophobia, lacrimation, and pain are greater. In 70 cases of carefully examined syphilis Vaughn¹ found the uveal tract involved 29 times. The symptoms were largely those of iritis, due to whatsoever other cause. Syphilitic choroiditis is always exudative, but never purulent. In chorioretinitis the process primarily involves the choroid, and the retina afterward. Trousseau² affirms that specific iritis is usually the forerunner of other grave phases of the general disease. Of 61 patients treated during the past 7 years, he has kept 40 under prolonged observation. Of this number only 6 have escaped grave consequences; 9 developed serious complications, not, however, invading the nervous system; 3 unfolded the symptoms of general paralysis; 12 became tabetic after some years; 8 showed brain symptoms of a more or less obscure type sooner or later; and 2 died, most probably from masked syphilitic lesions.

Tuberculosis.—Pechin's³ review of the literature of tuberculosis of the iris and ciliary body is a complete summary of the subject. It shows that, while it may appear at any period of life from earliest infancy to extreme old age, it is usually seen between the fifth and twenty-fifth years. When only one eye is attacked (which is the rule), the infection is generally more profound, and often invades the posterior uveal tract. The author considers uveal tuberculosis almost always secondary. He does not agree with Wagenmann, that this process lowers the ocular tension. While spontaneous cure has been reported, it is exceedingly rare. Of especial importance is the ease with which this clinical picture is confounded with syphilitic, rheumatic, and leprous diseases of the iris and new growths originating in that tissue. The author believes iridectomy useful in cases of solitary tubercle, with good light-perception and vision.

W. Watson Griffin⁴ diagnosed **leukosarcoma** of the left iris in a young woman of 19. Through the pupil could be seen a growth pushing forward the iris at the lower and outer side. The lens was partly opaque and was displaced inward. Feeling that the growth was malignant, Griffin excised the eye and found that the microscope confirmed his suspicions. He thought that in a case treated so early as this the prognosis should be good.

SYMPATHETIC OPHTHALMITIS.

It is instructive to note the cure of sympathetic ophthalmitis without operation. Differences of opinion must of necessity exist as to how long an interval of time must elapse before the healthy eye is out

¹ Jour. Am. Med. Assoc., Sept. 15, 1900.

² Ann. d'ocul., May, 1900.

³ Gaz. hebdom. de méd. et de chir., Jan. 28, 1900.

⁴ Oph. Rec., Oct., 1900.

of danger. Two years without relapse, according to Rogman and Randolph (quoted by de Schweinitz), may be regarded as comparatively safe. G. E. de Schweinitz¹ cites a well-marked case, in which no doubt as to the diagnosis may be expressed, that was cured by leeching, atropin, mercury protoiodid, full doses of quinin, and the enucleation of the exciting eye. Five and a half years have passed without recurrence. W. C. Bane² treated a case successfully with sodium salicylate and mercurial inunctions; no relapse in 6 months. The discussion³ by T. Collins and D. Marshall of C. Shaw's case of sympathetic ophthalmitis commencing 40 days after enucleation of an injured eye pointed to mistaken diagnosis, and in a degree indicated that the disease of the remaining eye was an independent affection. [And this is probably true not only of Shaw's case, but of others in which it has been claimed that enucleation may develop weeks or months afterward, or at least not check sympathetic disease.] Peters⁴ sets forth the proposition that sympathetic ophthalmitis is probably tuberculous in nature rather than of pyogenic origin. He brings a strong array of facts to the support of his contention, and further believes that many cases of **chronic insidious iridochoroiditis** with blindness and lowered tension after either injury or operation may rest upon a tuberculous basis. On the other hand, H. Gifford⁵ adheres firmly to his belief that sympathetic ophthalmitis is an infectious disease caused by germs yet to be determined. They may take one of various paths from one to the other eye. The eyes that cause sympathetic ophthalmitis are generally the seat of a slow inflammation, such as we should expect to be caused by a comparatively small quantity of germs; and until there is some test for them as reliable as the inoculation test for tuberculosis, it need be no great surprise if the germs of this disease elude our search.

GLAUCOMA.

S. O. Richey⁶ attempts to trace the origin of both the inflammatory and the noninflammatory forms to the gouty diathesis, and believes that the closure of the filtration angle, so long accepted as the exciting cause, is the result of the glaucomatous process. He says that chronic glaucoma is an expression of an inherited tendency to prematurity; acute glaucoma is a personally acquired spasmodic declaration of an inclination toward a tissue change of the same character. "Increased intraocular tension, advance of the lens and iris, with shoaling of the anterior chamber, dilation of the pupils, exophthalmos, and chemosis, are but the natural and usual consequences of venous stasis in this organ. If the stasis be due to pressure upon the vorticosse veins as they pass through the meshes of the sclerotic, by the increased volume of arterial blood forced into the eye by an excited heart, the intraocular space is reduced from behind and from all sides, causing advance and anteropos-

¹ Oph. Rec., Aug., 1900.² Lancet, Dec. 30, 1899.³ Ann. Ophth., Jan., 1900.

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⁴ Oph. Rec., Sept., 1900.⁵ Zeit. f. Augenh., May 1, 1900.⁶ Phila. Monthly Med. Jour., July, 1899.

terior elongation of the vitreous body, which thus makes pressure upon the ciliary body and iris, dilates the pupil, flattens the lens, and shoals the anterior chamber. At this stage of the attack closing of the anterior channels of filtration may occur by the application of the iris to the cornea, thus blocking Schlemm's canal."

Iridectomy.—Abadie,¹ who has given much study to the **etiology and treatment** of glaucoma, favors **iridectomy** in the acute and sub-acute phases of the disease. If this measure fails, he falls back upon miotics; failing with which, he would seriously consider ablation of the cervical sympathetic. In simple chronic glaucoma miotics are used bi-daily, with resection of the sympathetic again as a last resort. This operation he deems the best measure in hemorrhagic glaucoma, and it should be done as early as possible, along with leeching at the temple and ergot and quinin sulphate internally. [It is somewhat surprising that nothing is said about the utmost care in refracting these persons or about massage—both measures of decided value in some phases of glaucoma. Nor is there any mention of the antilithic therapy so commonly applied in this country in such cases.] This last opinion was expressed at the International Congress of Paris, 1900.²

Basing their conclusions on results obtained in 13 cases 6 to 7 months after operation, Truc and Cauvin³ claim that iridectomy is of much benefit in chronic simple glaucoma. Sclerotomy may be of value as a preparatory measure in some cases, especially in painful absolute glaucoma, but for all other forms of the disease they prefer iridectomy. [In our own practice (case not hitherto reported) the beneficial effects of a large iridectomy made exactly at the corneal limbus are well shown. The patient was a woman of 70, well nourished and unusually vigorous for one of her years. Vision in the left eye had fallen to light perception; no improvement in that eye was noticed after operation. In the right eye vision before iridectomy equaled $\frac{6}{200}$, with concentric narrowing of the visual field; no improvement by optical correction. Three months after iridectomy, and with the constant exhibition of eserine locally and strychnin internally, central vision improved to $\frac{20}{70}$ with +3 Cyl. axis 180. The limits of the field were not materially enlarged. Most of the contributions bearing on the management of glaucoma have treated of the cure by means of excision of the sympathetic ganglion in the neck. This operation is comparatively new, and probably it is on this account that it has been rather frequently performed, the operators being stimulated, no doubt, by their knowledge of the inefficacy of other remedies and by the blindness which is nearly invariably its termination.] Jonnesco⁴ has operated 7 times for the cure of glaucoma by **resection of the cervical sympathetic**,—1 acute, 3 absolute, 3 chronic,—with the result (a) lasting reduction of tension; (b) contraction of the pupil; (c) disappearance of pain; (d) improvement in vision, surprising in its rapidity

¹ La Clin. Ophthal., Jan. 10, 1900.

² Arch. d'Oph., Jan., 1900.

³ Rec. d'Ophthal., Sept., 1900.

⁴ Wien. med. Woch., May 4, 1899.

and degree, in chronic simple glaucoma. J. M. Ball ¹ had a partial cure in 1 case. M. Mohr ² adds 3 to the recorded list. There were no unpleasant effects and the operation was certainly beneficial in all three of the cases. Nicati, ³ working with his manometer, asserts that removal of the cervical sympathetic is followed eventually by great lowering of the ocular tension, but also produces damage to the eye. Iatropoulas ⁴ reports the complete failure of excision of the superior cervical ganglion in a case of monocular glaucoma. Allard ⁵ reports 8 cases of glaucoma simplex treated by **galvanization of the cervical sympathetic**. He places the positive pole on the back of the neck and the negative pole parallel to the anterior border of the sternomastoid muscle, using from 15 ma. to 20 ma. In 2 cases the peri-orbital pains were quieted; in 3 vision was improved in 2 months—12 to 15 treatments; in 1 the progress of the disease was checked; in 2 vision was decidedly (and he thinks permanently) improved. M. E. Valude ⁶ reports equally successful results by "intensive electrification of the cervical sympathetic." He employs from 15 ma. to 20 ma., with an electromotive force of 20 volts, continued for 15 to 20 minutes. The negative pole is applied to the neck; the positive pole is connected with a tongue-shaped electrode, covered with chamois skin and protected by a layer of cotton-wool, well soaked in hot water and applied to the anterior border of the sternomastoid muscle.

G. M. Gould ⁷ emphatically reaffirms his belief that the **fundamental cause** of glaucoma in a large majority of cases is long-continued preexisting **eye-strain** increased beyond the endurance of the eye by presbyopia, pointing in evidence to the fact that glaucoma is rarely seen in eyes cared for by a skilful ophthalmologist prior to and during the glaucoma age. He recites several instances in which he has combined massage with the relief of eye-strain with flattering results. The best results are, of course, obtained when the damage is still mostly functional, but he claims that even after structural change brings forth amblyopia that is not helped by glasses, the eye may be kept quiet and enucleation averted by routine daily massage. From 3 to 5 minutes' palpation through the closed lids is usually necessary to restore normal tension. Epinatieff ⁸ states that vibratory massage increases diffusion of liquids into the anterior chamber, hastens absorption of pathologic products from it, and lowers the intraocular tension.

H. Knapp ⁹ developed in a patient blind with glaucoma in the right eye an acute attack in the left, already predisposed, according to the patient's symptoms, to glaucoma, by the instillation of 2 minims of a 7.5% solution of **euphthalmin** in each eye, and at the same time induced an increase in tension in the blind eye. The attack was overcome in a short time by the instillation of a 1% solution of **eserin**

¹ N. Y. Med. Jour., July 1, 1899.

² Klin. Monatsbl. f. Augenh., Mar., 1900.

³ Arch. d'Oph., Feb., 1900.

⁴ La Clin. Ophthal., Oct. 25, 1899.

⁵ Interstate Med. Jour., Feb., 1900.

⁶ Jour. Eye, Ear and Throat Dis., May-June, 1900.

⁷ Canadian Jour. Med. and Surg., Nov., 1899.

⁸ Thesis, St. Petersburg, 1899.

⁹ Arch. Oph., May, 1900.

after 2 drops of a 2% solution of **pilocarpin** had failed. [Since the mydriatics favor the development of glaucoma by their mechanical action in dilating the pupil rather than by any inherent quality of the various drugs themselves, there is no reason, except the transitoriness of its action, why euphthalmin should be considered exempt from the danger common to them all.]

Spasm of accommodation during the course of glaucoma is certainly rare. J. A. Lippincott¹ reports an instance as studied in a married woman of 30 with high oblique astigmatism. Strangely enough, a weak eserine solution seemed to relax the ciliary muscles, although 5 weeks passed before the eye returned to its real refraction. Lippincott thinks the phenomenon is fairly well explained by Dobrowski, who attributes the spasm to irritation of the ciliary body due to the changes incident to the glaucoma. Webster and Thompson² report a case of glaucoma accompanied with subhyaloid hemorrhages coming on after an iridectomy had been performed. The urine of the patient was loaded with albumin and contained numerous casts, and glaucoma was supposed to have resulted from an albuminuric retinitis, though the unioocular variety is very rare. The eye was finally enucleated because of the oft-recurring hemorrhages and the pain felt in it. Some trouble was experienced in controlling the bleeding after the eye had been removed, and pressure bandages had to be used for several days.

Complication.—E. Lubowski³ reports a case of glaucoma that completely concealed extensive tuberculosis of the retina, iris, anterior chamber, and other ocular tissues, and from which it probably arose. Most cases of tuberculosis are associated with lowered tension. L. A. Bize⁴ details a case of acute glaucoma with only moderate tension (never over +1), but with severe pain that was partly controlled by eserine and wholly relieved by quinine. The recurrence of the attacks periodically led him to suspect their true nature—malarial.

LENS.

Cases of **congenital dislocation** of the lens are so common that it would seem scarcely worth while to add to the published reports, but in the case of W. H. Wilder⁵ there was the interesting feature that a mother and two children were affected symmetrically in each eye, but each individual differing from the other two. In the mother each lens was dislocated upward and to the right; in the girl, aged 10, one to the right and one to the left laterally and symmetrically; and in the little boy, aged 5, both lenses were to the nasal side and showed an equal area in the pupils.

A. Alt⁶ does not accept the usual common theory that **anterior polar cataract** is the result of intra-uterine contact between the anterior lens capsule and the posterior surface of the cornea. As the result of

¹ Ann. Ophth., July, 1900.

² Arch. Oph., May, 1900.

³ Jour. Am. Med. Assoc., No. 31, 1899.

⁴ N. Y. Med. Jour., Sept. 1, 1900.

⁵ N. Y. Med. Jour., Sept. 16, 1899.

⁶ Tr. Am. Ophth. Soc., July, 1899.

his examinations of a number of eyes he is inclined to believe that the prime cause of the formation of an anterior polar cataract is some congenital malformation of the lens, and that this represents a break in the continuity of the capsular epithelial layer as well as a dissolution of contact between this layer and the lens capsule. This would permit the penetration of substances into the lens, and possibly the formation of cataract.

Bates' ¹ remarks on the development and anatomy of **secondary cataract** are worthy of attention. He says: "(1) Secondary cataract in the rabbit is composed of new connective tissue, usually, together with the folded posterior capsule of the lens. But the opacity of the structure occupying the pupillary area is due to the new connective tissue, and not to the capsule. (2) The formation of secondary cataract in the rabbit begins with the accumulation in the anterior chamber of a coagulable fluid at the time of operation. Fibrin appears in the pupillary area from the coagulation of this fluid. Later, new connective tissue replaces the fibrin. (3) The prevention of secondary cataract in the rabbit may be secured by performing a quick operation, closing the scleral or corneal wound with sutures, and restoring the anterior chamber with normal salt solution." A description of the operation follows; the author insists that this must be performed quickly, keeping the anterior chamber filled with a normal salt solution. The newest idea as to the causation of cataract comes from E. Jonas, ² who claims that **senile cataract** is a reflex affection having its origin in disease of the nares. Independently of injuries and constitutional disorders, a slowly developing nasal trouble with existence of changes at a certain point constitute the conditions necessary to the formation of cataract. [It will take a vast array of the most convincing laboratory and clinical evidence to win acceptance for this view. The **extraction** of the lens by the simple operation seems to be the operation of choice of most surgeons; and when one's experience every year is large and includes many extractions, the simple method, we believe, presents the most advantages—is, in fact, the ideal operation. For those whose opportunities are limited, and who have learned and have been fairly successful with the combined operation, the substitution of the simple would be unwarranted. Even among the operators whose experience is large the combined operation has regained a little of its lost favor.] Theobald's ³ experience in 100 consecutive cases has led him to revert to the modified Graefe extraction. He makes a section in the sclerocorneal junction, a narrow conjunctival flap, and a small iridectomy. R. W. Payne ⁴ introduces the Kalt suture in cataract operations in persons who are nervous, have no self-control, and are hard to manage the first few days after extraction, and has had only good results. [Other operators choose in preference to the Kalt suture a preliminary iridectomy. In our own experience this plan has been followed by favorable results.

¹ N. Y. Med. Jour., July 7, 1900.

² Woch. f. Ther. u. Hyg. des Aug., No. 30, 1900.

³ Am. Jour. Ophth., Dec., 1899.

⁴ Pacific Med. Jour., Feb., 1900.

The patient thereby loses his fear of operation and of the operator, and learns from his own experience that there is no pain connected with the operation. We have found that the extraction was attended with no unusual difficulties. Another alternative in these unruly cases is the administration of ether. On several recent occasions we have been obliged to etherize the patient in cases of loss of self-control, alcoholism, and a mild form of insanity not uncommon among the lower classes of hospital patients.] G. C. Harlan¹ discusses the question of treatment of prolapse of the iris after simple extraction of cataract, and concludes that it is by no means so serious an accident as many authorities have considered it, and that small hernias may be safely let alone unless they interfere with the closure of the wound. In extensive prolapse he advises prompt abscission when replacement is impracticable.

As a preliminary to the operation, Valude² recommends that the lacrimal secretion be examined chemically: *i. e.*, its reaction tested. He found that if the fluid is acid, the eye must, as a rule, be considered predisposed to postoperative infection. J. A. Andrews³ and G. E. de Schweinitz,⁴ following H. Knapp's⁵ suggestion, have injected sterile salt solution into collapsed eyeballs following the loss of vitreous during cataract operations with phenomenal success. [Our experience justifies this procedure. Enormous quantities of vitreous may be replaced by the salt solution, and eyes that would certainly have been blind have been saved with useful vision.] E. B. Heckel⁶ cites a case of diabetic cataract occurring in a Jewess aged 17, in whom the recovery after operation was entirely without incident.

W. C. Posey⁷ collected a number of cases of delirium following extraction of cataract. He reaches the opinion that its cause is largely psychic, due to the preoccupation upon the part of the patients prior to and after the operations, aided by the constraint of the supine position and the stillness of the surroundings. He has found that the best remedies are nitroglycerin, gr. $\frac{1}{100}$, and erythrol tetramitrate in doses of $\frac{1}{2}$ to 1 grain. Regarding the after-treatment of operated eyes without a bandage, K. Mohillo⁸ says that no case out of 118 cataract extractions showed any mental depression, and but one eye was lost. As a disadvantage, more astigmatism was found than is usual after the bandage treatment. The contraindications to the open treatment of wounds, including cataract extraction,⁹ are severe iritic injection, hemorrhage into the anterior chamber, and prolapse of vitreous.

W. L. Pyle's¹⁰ collection of published accounts of the spontaneous disappearance of senile cataract, and a report of his own case, are quite sufficient to dispel any doubt that may still remain in the minds of surgeons that the lens opacity may practically disappear and vision be regained without operation. This occurrence is extremely rare, and may be regarded as simply an interesting incident in the history of cataract.

¹ Oph. Rec., Feb., 1900.

² Arch. Oph., May, 1899.

³ Arch. Oph., Jan., 1900.

⁴ Phila. Med. Jour., Sept. 15, 1900.

⁵ Walter, Arch. f. Augenh., July, 1899.

⁶ Ann. d'ocul., Sept., 1899.

⁷ Oph. Rec., Aug., 1900.

⁸ Ann. Ophth., Jan., 1900.

⁹ Centralbl. f. Augenh., Dec., 1899.

¹⁰ Phila. Med. Jour., Mar. 17, 1900.

Complicated Cataracts.—The natural deductions from G. Gutmann's¹ report of 45 complicated cataract extractions are that disease of either the anterior or posterior part of the eye is no contra-indication to the extraction of cataract, and that in 75% of such cases improvement in vision may be hoped for if a strictly aseptic technic is adhered to. Critchett's operation for the restoration of vision, by which the lens is broken up and driven into the anterior chamber and then absorbed, in cases of blindness from iridocyclitis or from lenticular and capsular cataract, was successfully performed by G. de Schweinitz² on a man of 53. He says that it is essential to success that the eye shall be free from vascularity and photophobia for some time before the operation. In after cataract, when the membrane is thin, P. Callan³ uses Knapp's knife-needle according to the method advocated by Knapp. If the membrane is tough, the knife-needle does not cut, and is very likely to tear and to drag on the ciliary processes. He prefers in such cases the forceps scissors of de Wecker, after a corneal incision about 2 mm. from the limbus.

RETINA.

Minimum Visual Angle.—In an attempt to repeat and control Wueffling's experiments and determine the influence of colors on the appreciation of the minimum visual angle, Obario⁴ claims that it is much smaller than we have been accustomed to assume hitherto. He has further found that the use of colors has no influence upon the appreciation of this angle.

Visual Sensations.—In concluding the Bowman lecture for 1900 on the present state of our knowledge regarding visual sensation, R. Marcus Gunn⁵ affirms that the retinal rods are mainly concerned in the perception of light only, and states further: "Granting that the rods have this particular function, it by no means follows that the cones take no part in the appreciation of ordinary illumination, though their peculiar office is presumably the recognition of color and its variations. It would seem that a minor amount of stimulation that can be appreciated by the rods only must be excited before the cones come into functional activity."

Color.—Although it is usually held that all except 3% or 4% of male mankind possess normal color perception (or at least agree in seeing colors alike in the way we consider that they exist normally), O. H. Rood⁶ claims that no two people quite agree in their reaction to color stimuli. This he has found by using the Flicker photometer, a new instrument for estimating color perception. Of 11 individuals selected for experiment, he found but 3 whose perception reached the average for red, 3 for violet-blue, and 2 for green. Moreover, the defects varied from 1% to 20%. The females varied from the standard as much

¹ Arch. f. Angenh., Dec., 1899.

² Jour. Am. Med. Assoc., Oct. 13, 1900.

³ Oph. Rec., Oct., 1900.

⁴ Oph. Rec., Feb., 1900.

⁵ Anales de Oftal. (Mexico), Aug., 1900.

⁶ Post-Graduate, Oct., 1900.

as the males when it came to green, but surpassed them on the two other colors. Holden and Bosse¹ tested with great care and thoroughness the color perception of very young children. They were particularly careful to eliminate the confusion and uncertainty arising from conducting the tests under different degrees of luminosity. Their results are as follows: All tests before the age of 6 months were valueless; the first colors to be recognized at 7 and 8 months were red, orange, and yellow. In only a few was there any reaction to green, blue, and violet, although blue was more readily selected than either green or violet. At 9 months the reaction to the first 3 colors was prompt, but to the second 3 slow and indifferent, even at the tenth and twelfth months. In some cases the reaction to all 6 colors was equally prompt. They conclude that the perception of colors at the red end of the spectrum is acquired a little earlier than that at the violet end. C. H. Williams² offers a lantern for testing color perception that is an improved form of the one shown at the meeting of the American Medical Association last year. It is essentially a practical form of the Holland system, whereby color testing by both worsted and lantern is required. His claim is that the lantern gives certain information that we do not get with the worsted tests, especially in regard to small defects of the central portion of the retina, and, most important, in regard to the recognition of signal colors when affected by fog or smoke. However, both tests should be used in order to make sure that all dangerous cases of subnormal color perception are excluded from the public service.

Ophthalmoscopy.—Trantas³ states that by pressing upon the sclera during ophthalmoscopic examination certain portions of the eye-ground hitherto considered invisible may be brought into view. In some cases the ora serrata, and even the ciliary muscle processes, may be seen by oblique illumination. While the sclera is pressed upon, the observer will place his head as close as possible to the cone of the light thrown into the eye. By transmitted light with this method the position of the ora serrata and the shadow made by the ciliary body may easily be located. In this way abnormal changes, such as new growths, in the ciliary region may sometimes be diagnosed.

Albuminuric Retinitis.—Concerning this subject, J. J. Mills⁴ says that changes in the macular region occur much more frequently than they are observed or diagnosed when found. They are, moreover, much more frequent than changes in the optic nerve. It is very unusual to find one eye involved alone.

Snow Blindness.—Mitchell⁵ describes a case of snow blindness, and mentions the apparatus used in Alaska by the miners for avoiding it. He attaches very little value to colored glasses, holding that the real remedy is a wooden goggle, somewhat after the plan of pinhole spectacles.

That blindness may be caused by reflex irritation from bad teeth

¹ Arch. Oph., May, 1900.

² Jour. Am. Med. Assoc., Sept. 15, 1900.

³ Arch. d'Oph., June, 1900.

⁴ Maryland Med. Jour., Aug. 1, 1900.

⁵ Oph. Rec., Mar., 1900.

is claimed by H. C. Sloggett,¹ who studied the phenomena in a 35-year-old married woman. Twelve hours after extraction of some stumps on the same side as the affected eye full vision returned, only to give way again to complete amblyopia. Forty-eight hours later it again in its turn disappeared on extraction of 2 stumps that had been left in the jaw. [This looks very like hysteric amblyopia cured by the powerful impression incident to the removal of the dead teeth.] Santos Fernandez² adds to the list of hemeralopic cases already reported 3 new ones, in which the disease came on suddenly in the night, with total loss of vision. All were completely and promptly cured by the injection of horse serum. It is evident that he thinks the method of great value. [If the diagnosis of hysteria in these cases is correct (the possibility of which is granted by the author), hypnotic suggestion certainly seems more to the point than so extreme a measure as serum injections.]

Embolus.—H. W. Thomson³ calls attention to the infrequency of embolus as a *branch* of the central retinal artery, and recites a case in which the plug caused a positive and permanent scotoma in the field corresponding to a part only of the edematous retina. For the explanation of this case he accepts Clark's theory of supply of the involved portion of the retina by means of a ciliary retinal vessel.

Concussion.—Concussion of the retina is unusual. Since first described by R. Berlin⁴ few cases have been described. Sydney Stephenson records a case in a boy of 11 years, observed 12 hours after the eye was struck by a cricket ball. There was hyphemia, ecchymosis, T. —1, and dilated pupil; V., which was $\frac{5}{9}$, returned in 6 weeks to normal.

Detachment.—S. Theobald⁵ had unusual good luck in seeing a retina that had become spontaneously separated (in a case of M. of 8 D.) restored to its proper position and attachment under the administration of pilocarpin and rest in bed. The treatment was continued for 5 weeks, and was followed by a course of potassium iodid in small doses. There was no recurrence in 6 months. DeWecker⁶ recommends, in the treatment of retinal detachment, biweekly subconjunctival injections of normal salt solution 100 parts, white gelatin $3\frac{1}{2}$ parts, in connection with rest in bed, pressure bandage, and mercurial inunctions.

OPTIC NERVE.

Physiology.—H. F. Hansell's⁷ study of the physiologic variation in the size of Mariotte's blind spot furnishes much valuable definite knowledge on this subject. He shows that it has a greater bearing on the management of the field of vision than has been accorded it, and believes that it might easily be mistaken for a pathologic scotoma.

Toxic Amblyopia.—For several months past F. Dowling⁸ has been making an examination of the employees in all large tobacco fac-

¹ Ann. Ophth., April, 1900.

² Lancet, Jan. 6, 1900.

³ Arch. of Oph., Jan., 1900.

⁴ Am. Jour. Ophth., Nov., 1899.

⁵ Arch. Med. of Cadiz, April, 1900.

⁶ Klin. Monatsbl. f. Augenh., XI, p. 42, 1893.

⁷ Ophthal. Clin., June 20, 1899.

⁸ Jour. Am. Med. Assoc., Nov. 24, 1900.

tories in Cincinnati as to the existence of tobacco amblyopia. The males examined were between 35 and 65 years of age, most of them heavy smokers and chewers of tobacco; the females ranged from 16 to 45, only 2 of whom showed any tobacco blindness. He is inclined to think that the tobacco-laden atmosphere of these establishments, with a goodly supply of dust thrown in, has very little influence in causing tobacco blindness, although it does seem to count heavily against the physical condition of the employees. Of 30 negroes examined, none showed evidence of optic nerve disease, from which Dowling concludes that the negro enjoys immunity from tobacco blindness. Myosis was the most frequent of all the symptoms noticed in this series of cases. Dowling says that he could almost always tell in advance by looking at the pupils whether the subject would present objective evidence of optic nerve disease.

The report of Uthoff¹ before the International Medical Congress on the toxic amblyopias is an admirable summary of the whole matter. It arranges them in several groups. The first one comprises the cases of retrobulbar neuritis with central scotoma but intact peripheral visual field. Prognosis is favorable, as the process generally involves only a limited bundle of fibers, and alterations in the vessels are rare. Alcohol and tobacco lead, etiologically, in this group; after which come, in their order, carbon disulphid, arsenic, iodoform, stramonium, hashish, and one of the autointoxications—namely, saccharine diabetes. In the second group, characterized by changes in the vessel-walls and direct action of the poisons on the nervous substance, quinin is accorded first place, followed by salicylic acid, Filix mas (male fern), and pomegranate. Lead amblyopia seems to take a middle place between the two foregoing groups. An important point yet to be decided is whether an intoxication (be it endogenous or exogenous) can produce total simple atrophy of the optic nerve. One thing seems relatively certain—that central scotoma with an intact peripheral visual field seldom, if ever, appears in simple tabetic atrophy. Uthoff believes we can not yet unreservedly accept the theory that toxic amblyopia is primarily an inflammation of the ganglion cells of the retina with simple ascending atrophy of the optic nerve-fibers. It is quite possible that the retinal cells are attacked secondarily, a supposition that is supported by the recent work of Siegrist. His feeling is that the same etiology for tobacco-alcohol amblyopia as for the other intoxications has not yet been proved. A. Druault's² researches are of much interest in this connection. His experiments (made in the Ophthalmic Laboratory of the Hôtel Dieu) show that grave quinin intoxication is always accompanied by visual disturbances caused by degeneration of the retinal ganglion cells and the optic nerve-fibers. He places the primary lesion in the nucleus of the ganglion cells, where not inconsiderable changes can be found 10 hours after the quinin injection, although all parts of the ganglion layer are not equally affected. The direct action of the quinin on the ganglion cells is further shown

¹ Rapports de la Sec. d'Ophthal., Paris, 1900; abst. in Oph. Rec., Oct., 1900.

² Recherches sur la pathogénie de l'amaurose quinine, Paris, 1900.

by the fact that the first anemia (during the first day) is less marked than the later anemia (appearing some days afterward). The author grants, however, that vasomotor constriction may play a feeble accessory rôle in producing the degeneration. "Section of the cervical sympathetic does not," he says, "sensibly modify the retinal circulation." After section of the optic nerve the retinal cells degenerate less under quinin intoxication. According to C. A. Wood,¹ much more toxic amblyopia has been reported since **methyl** or **wood alcohol** has come into larger use in the industrial arts. He claims that persons who by the nature of their work are obliged to inhale its fumes develop double optic neuritis, with subsequent atrophy and loss of useful vision because of the inevitable central scotomas. Improvement in vision usually follows the first attack of blindness, but it does not seem to be retained. The action of the poison is probably first on the axial fibers of the nerve (Gifford) rather than upon the retinal ganglion cells (Holden).

Two more cases of amblyopia following the ingestion of methyl alcohol are reported by Raub,² and conform in all particulars to the series reported by Gifford last year. (See YEAR-BOOK for 1900.) In E. Stieren's³ case the amblyopia followed the consumption of grocery-store essence of ginger. Prompt vigorous eliminative treatment restored the man to full vision in one week. [This man was completely blind at the time Stieren first saw him. To secure full vision at the end of a week is certainly an unusual showing, and Stieren is to be congratulated. The lesson pointed by this case is obvious.] In the case reported by L. D. Brose⁴ the blindness, which though complete was only temporary, followed the use of iodoform gauze for the dressing of extensive burns. The dressings were renewed daily for 4 weeks, at the end of which time it was noticed that the patient had lost all light perception. The optic disc was swollen and the veins were tortuous. Different dressings were used, and on the eighth day light perception returned and vision gradually increased up to $\frac{20}{100}$. At that time the discs were pallid on the temporal side, and there remained in the visual field a small absolute scotoma for white and a larger one for colors. H. Friedenwald reports left-sided incomplete **hemianopsia** due to intoxication from illuminating gas. He attributed the condition to cerebral hemorrhage, locating the lesion in the visual cortical center, because of the incompleteness of the hemianopsia, the absence of Wernicke's pupillary reaction, and the absence of a positive scotoma in the defective half of the field. Next in importance to headache among the symptoms of brain tumor, W. H. Wilder⁵ places **optic neuritis**, which he says is present in 80 % of cerebral and in 90 % of cerebellar tumors. It is, however, of little value as a localizing sign, nor does it furnish any information as to the nature or size of the growth. The important point is that optic neuritis should be carefully looked for in all cases of suspected local disease of the brain, and in all the varied stages of such

¹ Jour. Am. Med. Assoc., Dec. 30, 1899.

² Oph. Rec., Dec., 1899.

⁴ Arch. Oph., May, 1900.

³ Penna. Med. Jour., Sept., 1900.

⁵ Jour. Nerv. and Ment. Dis., Aug., 1900.

processes, for it may be present in spite of the fact that central vision is normal. On the other hand, the **diagnosis of brain tumor** by optic neuritis, headache, and other symptoms of cerebral new growth, is not always easy. For instance, in Englehardt's ¹ case it was shown that a double optic neuritis and subsequent degeneration of the optic nerves that had been held to be signs of masked brain tumor were clearly due to chlorosis. C. K. Mills ² report shows that concentric contraction of the form field and reversal of the color field may be associated with organic brain disease. The tumor, said by Spiller to be perithelioma or endothelioma, was removed for Mills by W. W. Keen from the left superior parietal lobe. The symptoms had extended over a period of 10 years, and were exceedingly suggestive of hysteria: namely, despondency, headache, formication and heaviness of the right arm and leg, slight diminution of hearing, taste, and smell in the right side, and amnesia. Although there was slight inequality of the pupils, optic neuritis was not found at any stage of the process. In 17 cases of brain tumor carefully studied and recorded by T. Diller ³ optic neuritis and ocular palsies were present in 10 cases. The latter the author regards as important localizing symptoms.

Atrophy.—C. S. Hawkes ⁴ reports 2 cases of hereditary optic atrophy transmitted through the family line and affecting only the males. The patients became blind at ages between 15 and 48. Another striking instance of this disease is recorded by H. F. Hansell, ⁵ occurring in 3 brothers, one of whom fell under his observation. These patients became blind at the ages of 35, 52, and 56 respectively. [In this disease the word *blindness* is used relatively. It is characterized by the sudden development, in comparatively healthy men, of an absolute central scotoma. In the early stages of the disorder there is usually moderate optic neuritis, passing slowly into partial optic atrophy. *Usually* vision is lost, while the ability to discern large objects and to move about with a certain degree of freedom remains.] K. Noisewski ⁶ tells of a 42-year-old married woman who, notwithstanding almost complete white atrophy of both optic nerves, showed a well-marked pupillary reaction to light, accommodation, and convergence. She seemed to be devoid of light perception, and yet she distinguished without trouble very small blue objects at a distance of 1.5 meters; for instance, a blue flower, a small blue bottle, or a small bit of blue ribbon. This unique phenomenon can be explained only on the assumption that perception of the different spectral colors takes place in the different layers of the retina, with the probability that violet and blue are perceived by the inner, and red by the outer, layers. Traumatic division of the optic nerve between the globe and the optic foramen generally means immediate and permanent blindness, with loss of the pupillary response to light. F. Mendel ⁷ states that in **traumatism of the optic nerve** the ophthalmic

¹ Münch. med. Woch., Sept. 9, 1900.

² Jour. Nerv. and Ment. Dis., May, 1900.

³ Australas. M. Gaz., June 20, 1900.

⁴ Jour. Am. Med. Assoc., Feb. 24, 1900.

⁵ Penna. Med. Jour., July, 1900.

⁶ Tr. Am. Ophth. Soc., 1900.

⁷ Berl. klin. Woch., Nov. 9, 1899.

findings vary according as the lesion is in front of or behind the entrance into the nerve of the blood-vessels. If in front of the blood-vessels, hemorrhages and edema of the retina will likely be found; if behind the blood-vessel entrance, atrophy of the nerve-head will in all probability appear some weeks after the injury. In partial division of the nerve the primary blindness is naturally followed by partial return of vision, with certain visual field defects as a matter of course. In a rare case of binasal hemianopsia S. M. Burnett¹ believes the lesion to have commenced in the right optic tract, and, after involving the uncrossed optic fibers, to have extended horizontally to the same fibers in the left tract. The essential lesion of the nerves was retrobulbar neuritis. It was an injury case, and papillitis appeared on the right side soon after the trauma, but not on the left side until 3 months later. The hemianopsia was complete and permanent in the right field immediately after the accident, but did not appear in the left field until the papillitis developed. In concluding an elaborate article on **hemianopsia**, Schmidt-Rimpler² assigns as causative agents the following: cerebral hemorrhage, atheroma, aneurysms, tumors, softenings, abscesses, pachymeningitis, and cerebral congestion, with edema. He shows the frequent difficulty in locating the cause, and finally outlines the differential diagnosis. His therapy offers nothing new, unless perhaps exploratory craniectomy in certain cases.

THERAPY.

Mixed Treatment.—G. H. Burnham³ again emphasizes his claim of two years ago (see YEAR-BOOK for 1898), that mixed treatment in old specific and even in nonspecific cases is vastly more effective and attended with much less discomfort to the patient when combined with the sweat-cure. The latter he obtains by a systematic daily hypodermic injection of pilocarpin, $\frac{1}{12}$ to $\frac{1}{4}$ of a grain. The drug is carried to its physiologic limit: *i. e.*, full flow of saliva and the heaviest sweat the heart will allow. He speaks of the method as his own, and urges a fair and impartial trial of it. [We heartily agree that the combination suggested is very efficient, more so than any other method known to us; but we are not sure that Burnham ought to claim proprietorship.]

Protargol has declined little, if any, in popularity during the past year in the treatment of purulent diseases of the conjunctiva and cornea. F. C. Hotz⁴ claims that in progressive affections it has a great advantage over silver nitrate in that it is nonirritating and non-caustic even in strong solution. He had tested it in acute dacryocystitis, acute gonorrheal conjunctivitis, and suppurative keratitis with good results. De Schweinitz⁵ thought it useful in children because of its painlessness, but it could do nothing that silver nitrate could not do. In the first stage of trachoma Wicherlicviz⁶ uses it in 5% to 10% solutions with better results and greater confidence than he reported a

¹ Arch. Oph., Jan., 1900.

² Ann. Ophth., July, 1900.

³ Ibid.

⁴ Ann. Ophth., April, 1900.

⁵ Am. Med. Assoc.; Oph. Rec., July, 1900.

⁶ Wien. med. Woch., Nov. 18, 1899.

year ago. The trachomatous conjunctiva is rubbed with a cotton swab carrying the 10% solution once daily at first, and 2 to 3 times weekly when improvement begins. Two months are generally sufficient for a cure, and while the characteristic scars are found, they are not so broad or deep as after the usual methods. He also found protargol of value in the treatment of spring catarrh. In addition to protargol, modern pharmacy has furnished us with several substitutes for silver nitrate, such as argentamin, actol, itrol, and argonin. Largin, the latest silver nitrate substitute, contains 11% : *i. e.*, is richer in the percentage of metal than any of the other compounds. The watery solution keeps well in suitable vials, and is precipitated neither by albumin nor chlorids. S. Stephenson¹ pronounces it painless even in concentrated form, but prolonged use will stain the conjunctiva much the same as protargol. He found that it acted admirably as a temporary remedy after any of the operations commonly practised for the relief of trachoma, but it is not nearly so effective as zinc in diplobacillary conjunctivitis.

Calomel.—Heddaeus² is in the habit of using calomel internally in phlyctenular conjunctivitis, prescribing as many milligrams as the child is months old. Over 3 years of age, he administers a centigram for each year of age (up to 5 years).

Mydriatics.—In 150 cases in which 10% solutions of euphthalmine had been used, A. B. Hale³ found that it produced no subjective symptoms, furnished mydriasis for about 30 minutes, was without effect on the accommodation, the ocular tension, the vessels of the conjunctiva, or the corneal epithelium, and was nonpoisonous. For the general practitioner, the neurologist, and the ophthalmologist, he thinks it is unequaled for purely mydriatic purposes. From 30 cases selected from private and dispensary practice in whom scopolamin and atropin were applied to learn the relative action of the two drugs, Rogers⁴ found that scopolamin contrasted unfavorably with atropin. In only 1 of the 30 cases did both eyes show the same refraction under each drug. He concludes that scopolamin is untrustworthy. Demicheri⁵ has seen scopolamin-poisoning twice. Both times the phenomena was studied in children in whom the drug was used for keratoiritis. [Unfortunately for the science of the question, the author does not mention the amount of drug applied in either case.]

Subconjunctival Injections.—H. Vogel's experiments⁶ show that the chemical properties of solutions injected under the conjunctiva have probably little to do with the good that often follows their use.

Massage.—Massage continues quite popular in the management of chronic noninflammatory glaucoma and to promote absorption of corneal opacities. Darier⁷ reports his experience with Domec's method of pressure massage, consisting in rhythmic pressure upon the center of the

¹ Brit. Med. Jour., Mar. 17, 1900.

² Woch. f. Ther. u. Hyg. des Aug., No. 30, 1900.

³ Chicago Med. Recorder, Feb., 1900.

⁴ Jour. Am. Med. Assoc., Sept. 15, 1900.

⁶ Arch. f. Ophth., Graefe, No. 3, vol. XLIX.

⁵ Ann. Ophth., Jan., 1900.

⁷ De Oph. Klin., Sept. 20, 1899.

cornea with the thumbs through the closed lids. The movements must be gentle at first, of 5 minutes' duration, and should be used once every other day for 3 weeks, then suspended for a month, and then resumed for another 3 weeks. Its effects are said to be increase of the visual acuity in hypermetropia and hypermetropic astigmatism, relief of accommodative asthenopia, and striking increase of vision in amblyopia, probably because of the improved nutrition.

Local Anesthetics.—R. B. Carter¹ confirms Darier's claim of a year ago, that acoin introduced subconjunctivally (under cocain), along with mercury cyanid 1:1000, renders the latter injection absolutely painless. [This ought to revive the subconjunctival use of some of the mercury salts, which were abandoned largely because of the pain they produced.] The latest candidate for favor is chloretone, a derivative of butyl-alcohol, slightly soluble in water, easily soluble in alcohol, ether, glycerin, and the essential oils, according to W. M. Donald.² Used first as a hypnotic in general medicine, it has been found to have distinct value in ophthalmic practice. H. I. McMorton³ claims that this value lies in its antiseptic properties combined with a mild anesthetic effect without affecting the pupil or accommodation. This unusual combination of qualities renders it useful in two ways. McMorton prefers this drug to cocain in removing foreign bodies from the cornea, but its action on only the superficial layers of the cornea limits its use to this small field. As a preservative of collyria the writer recommends it especially for preparing stable solutions of the suprarenal gland. He adds 1 dram of the saturated solution of chloretone to 6 drams of the suprarenal liquid. This keeps the solution an almost indefinite length of time without organic change. [We have been using the latter combination as a hemostatic about the eye and to hasten the absorption of mydriatics and miotics in inflamed eyes, and have found it of great value.] Hoping to obtain a stimulating effect upon the lymphatic system, and thus to favor the absorption of atropin in a case of rebellious iritis, Darier⁴ discovered by accident that dionin possessed remarkable analgesic properties lasting for 2 days; moreover, the inflammatory condition improved rapidly. He believes that until further experiment furnishes precise information it is sufficient to state that we are in possession of a powerful **ocular analgesic** that will allay for long periods of time the most violent iritic pain by simply placing a small mass of the powder, about the size of a grain of wheat, in the conjunctival culdesac. Wolffberg⁵ employs **dionin** in 2%, 5%, and 10% solutions or in actual powder. Chemically it stands very close to morphin. Because of its decided stimulation of the lymph-system, this agent seems especially well adapted for use in all corneal affections. In combination with a 2% pilocarpin solution, 5% of dionin was used to great advantage in a case of glaucoma.

The real field of usefulness of **suprarenal liquid** is well defined by H. Landolt,⁶ who says that, in addition to its value in rendering the

¹ *Lancet*, Oct. 20, 1900.

² *Oph. Rec.*, Mar., 1900.

³ *Woch. f. Ther. des Aug.*, Oct. 26, 1899.

⁴ *Centralbl. f. prakt. Augenh.*, Nov., 1899.

⁵ *Therap. Gaz.*, Jan. 15, 1900.

⁶ *La Clin. Ophthal.*, Mar. 25, 1900.

site of an operation bloodless, it is of great use in the assistance it renders to the absorption by the eye of mydriatic and miotic solutions, which under ordinary circumstances lie almost inert in the conjunctival sac of badly inflamed eyes. He found the extract without special permanent influence in inflammations of the anterior ocular segment. [This is very fair and just. As a hemostatic, especially in tenotomy and advancements, the effect of suprarenal liquid is delightful, and there is no question but that it greatly aids the quick absorption of all collyria.] **Arecolin**, one of the alkaloids found in the areca nut, is said by J. C. Clemesma¹ to be a sialagog of the first rank, exceeding even pilocarpin. Salivation occurs 5 minutes after injection, and attains its maximum in about 15 minutes. The hydrobromate is a white, crystalline, soluble salt. Aqueous solutions of from 0.5% to 1% contract the pupil in from 3 to 5 minutes, reaching the maximum in 15 minutes. Its power of lowering tension in glaucoma is equal to that of eserine.

OPERATIONS.

The bacteriologic work of the past 4 or 5 years shows the futility of all attempts to render the conjunctival sac absolutely aseptic before operating. However, nature seems to have been especially kind in this matter, as pointed out last year by R. Randolph.² In his remarks on holocain he recorded his belief in the highly aseptic qualities of the tears. Hauenschild's³ experiments only emphasize the vanity of the present-day attempts at conjunctival asepsis. He leans toward antiseptics, and plainly shows his preference for mercury cyanid. He says that it is our most valuable antiseptic for practical purposes, if irrigation is kept up under tolerably high pressure for some little time. J. A. Lippincott⁴ sprays out both nares thoroughly with 1:2000 potassium permanganate solution a few hours before all operations that open the eyeball. His claim is that by this means there is obtained an unusual freedom from postoperative irritation or inflammation. In discussing the foregoing paper, de Schweinitz⁵ unqualifiedly indorsed all that had been claimed by Lippincott, but pointed out one disadvantage to be always borne in mind: namely, the marked sneezing sometimes produced by the permanganate. For this reason the spraying should be done several hours before operating.

Penetrating Wounds.—Van Milligen⁶ treated 3 cases of infected purulent wounds of the eyeball by galvanocauterization of the anterior part of the vitreous with extraordinary success. Similar treatment of a case of hypopyon after cataract extraction, in which the pus returned as often as it was removed, was quite as brilliant in its results. Peters⁷ tells of a child that 1½ years before it came under his observation had run a splinter of wood 3 cm. in length and 3 mm. in width into its eye.

¹ Buffalo Med. Jour., Sept., 1899.

² YEAR-BOOK for 1900.

³ Münch. med. Woch., Jan. 13, 1900.

⁴ Jour. Am. Med. Assoc., Oct. 13, 1900.

⁵ Jour. Am. Med. Assoc., Oct. 13, 1900.

⁶ Centralbl. f. prakt. Augenh., June, 1899.

⁷ Wien. med. Woch., Mar. 13, 1900.

There were marked cerebral symptoms for several days after the accident, but they soon subsided, and it was not until 18 months later that it became necessary to do enucleation for panophthalmitis. C. Lukens' ¹ report of 18 cases of penetrating foreign bodies removed at the Wills Eye Hospital shows how tolerant the crystalline lens is of such bodies and how pronounced is the phagocytic process in eyes so injured. Close study of these records shows plainly that all penetrating foreign bodies should be extracted as soon as possible, through the original wound of entrance if possible; that skiagraphs are absolutely indispensable when the foreign body can not be seen with the ordinary instruments of precision; that copper and stone lend much gravity to the prognosis; that the iris and vitreous are the only localities that offer much hope for the removal of a foreign body after the lapse of a considerable time; and that the ideal preliminary treatment is iced compresses and atropin locally. [To this we would add frequently repeated fractional doses of the mild chlorid of mercury internally.] Eleven additional cases in which the x-rays have been of great value in locating particles of iron in the eyeball are reported by A. B. Kibbe.² He takes 2 radiographs on the same plate, the tube being moved a short distance from its primary position in making the second exposure. As a "finder" he uses a large pin, placed in a piece of adhesive plaster, which latter is made fast to the closed eyelids. By this method, which he considers sufficiently accurate, he claims that radiographs may be taken in one's office in broad daylight and completed in about 20 minutes. Hence his preference for it over either the sideroscope or the large magnet.

Enucleation and Evisceration.—At the Thirteenth International Congress of Medicine, Paris, August, 1900, G. E. de Schweinitz submitted to the Section on Ophthalmology a paper based upon the opinions of American surgeons on the subject of "The Comparative Value of Enucleation and the Operations which have been Substituted for It." His conclusions, representing as they do the experience and opinions of many American operators in combination with his own, are worthy of careful attention. In abstract they are as follows: (1) Enucleation should be performed in sympathetic ophthalmitis or on eyes which contain malignant growths. (2) Also those in which a suppurative process has begun, provided it has not involved the surrounding orbital tissues; for the latter contingency evisceration is safer. (3) Also for eyes so wounded that they are likely to excite sympathetic ophthalmitis if 2 weeks or more have elapsed since the reception of the injury. (4) If seen before two weeks have elapsed, such eyes need not be enucleated, but evisceration or Mules' operation may be performed. (5) Staphylococcal eyeballs, when uninfamed, may safely be operated upon by abscission or keratectomy or by Mules' operation. (6) Greatly atrophied eyeballs should be enucleated. (7) Eyes blind from glaucoma or from chronic nontraumatic iridocyclitis may be treated by evisceration with or without insertion of an artificial vitreous, or by opticociliary neurotomy or neurectomy. (8) Enucleation is preferable in very old

¹ Ann. Ophth., July, 1900.

² Arch. Oph., Knapp's, Jan., 1900.

patients. (9) Evisceration as a substitute for enucleation is a safe operation, and temporarily yields a stump which is better than the stump after ordinary simple enucleation. (10) The best cosmetic results are secured by Mules' operation, which is positively contraindicated by malignant disease, sympathetic ophthalmitis, extensive laceration of the sclera, and phthisis bulbi. *But it should be remembered that the primary excellent cosmetic effect of Mules' operation slowly lessens, owing to atrophy of the tissues of the orbit and sinking in of the artificial globe.* (11) The substitution of the implantation of a glass ball or of a piece of sponge in Tenon's capsule for enucleation is permissible except in sympathetic and malignant disease, but its advantages are doubtful. (12) *There is no perfect substitute for enucleation.* When it is performed according to the rules of improved technic (which include suture of the severed tendons of the conjunctiva), the cosmetic effect of the operation is, primarily at least, as good as any of the substitutes, with the exception of Mules' operation and abscission, and is free from the objections which surround them. It seems likely that with further improvement of the technic, and particularly in the manufacture of artificial eyes, the cosmetic effect will be enhanced. (13) Simple enucleation, without attention to the preservation of the relationship between the conjunctiva, ocular tendons, and capsule of Tenon, should not be performed unless the disease of the globe and surrounding orbit demand this rude operation.

H. Schmidt-Rimpler's¹ communication before the same body urged evisceration as the operation for nonspecialists, but advocated evisceration in suppurative processes, and also in children in order to prevent asymmetry in later cranial development. The indications for optico-ciliary neurotomy are rare. It should never be performed unless the danger of sympathetic disturbances is very slight. For these reasons it should not be done in foreign-body injuries to the globe. The value of Kroelin's method of removing a postocular tumor without sacrificing the eyeball is illustrated by A. H. Knapp,² who successfully removed a tumor measuring 22 mm. by 30 mm. The method described in 1887 is as follows: [It is here repeated because of its proved service, and because it may not be well known on this side of the Atlantic Ocean.] "A slightly curved vertical incision is made along the outer bony margin of the orbit, dividing the periosteum. The periosteum lining the inner side of the lateral wall of the orbit is retracted, together with the soft orbital contents, and the inferior orbital fissure is localized. From the anterior end of the fissure the bony wall of the orbit is cut through with a chisel along two diverging lines: the one passing up and out to the external angular process of the frontal bone, the other in a horizontal plane passing out and forward, appearing on the external surface of the malar bone in a line directly above the insertion of the zygomatic arch. This wedge-shaped piece of bone is strongly forced backward, giving free access to the orbit. The periosteum is then incised."

The successful use of egg membrane for reuniting the raw surfaces

¹ Centralbl. f. Chir., July 12, 1900.

² Arch. Oph., Mar., 1900.

resulting from operation for symblepharon is reported.¹ The advantages of egg membrane for use in such cases are evident. It is very thin, yet tough; it is easily kept in place; it is worn with no discomfort to the patient; it is always easily obtained; and it can be made absolutely sterile. A note of practical interest is that the membrane is much easier to handle and cut if manipulated beneath a warmed normal salt solution.

REFRACTION.

Helmholtz's theory of accommodation—that usually accepted, although denied by Tscherning, Schoen, and others—has been experimentally sustained numerous times, and lately by W. N. Suter.² He says: "A fluid or gelatinous substance (the lens) inclosed in a contractile envelope (the capsule) would necessarily assume a sphenoidal form if not prevented by some counteracting force." The crystalline lens is pressed upon anteriorly by the aqueous, posteriorly by the vitreous, and inclosed in an elastic membrane.

School Life and Vision.—P. Callan³ thinks that the children in school have at present too much to do, and that the excess of study is proving injurious to their sight. He has examined 500 colored children, selecting them because he knew that these influences had not acted on their parents, and therefore there would be no hereditary tendency to myopia, and he found in the more advanced 3% of near-sightedness. H. F. Hansell⁴ reports the results of the examination of 52 individuals, comprising emmetropes, hyperopes, and myopes, in the determination of the physiologic variations of the size of Mariotte's blind spot. The greatest distance from the point of fixation to the center of the blind spot was 13.5 mm.; the least, 6.5 mm. The center was below the horizontal line running through the point of fixation, the distance varying from 25 mm. to 2 mm. The blind spot has a greater bearing on the measurement of the field of fixation than has been accorded it. As a result of the study of 200 consecutive cases of refraction in private practice, the same writer⁵ found that no arbitrary rule can be formulated that shall determine when a change in the correction is indicated. We must be guided by the age rather than by the refraction. Changes in the form of the eye are quite as frequent when the error is low as when it is high. Paralysis of accommodation alternating with spasm is reported by Bourgeois⁶ in an emmetropic patient 13 years old. The paralysis was complete, and continued 2 months; at that time it was replaced by spasm, when the visual acuity for distance was restored by —7. The spasm was probably due to the use of pilocarpin drops for the cure of paralysis, the pilocarpin having this unusual effect on account of an idiosyncrasy of the patient. The same author records a case of prolonged paralysis of accommodation following the instillation of cocain in 5% solution. The paralysis continued for 1 month and was relieved by instillations of pilocarpin for 5 days.

¹ Jour. Am. Med. Assoc., Feb. 24, 1900.

² N. Y. Med. Jour., Jan. 20, 1900.

³ Oph. Rec., April, 1900.

⁴ Arch. Oph., July, 1900.

⁵ Phila. Med. Jour., Oct., 1899.

⁶ Rec. d'Ophthal., June, 1900.

[The conditions bringing about a so-called "eye headache" appear to be an undue stimulation of the centers of nerves supplying the intrinsic and extrinsic muscles of the eye, causing a reflex vasomotor action referred to the meninges and producing congestion. It has been suggested that confusion of images also plays an important part in the causation of these headaches, and that there is no known instance in which they have followed excessive use of other than ocular muscles. The confusion of images may be an important contributing cause, but the muscular reflex probably plays the principal part. Although continued muscular exertion in general does not cause headache, it is probable that excessive and continued contraction of any muscle supplied by cranial nerves would do so. Obviously, except in the case of the ocular muscles, it is difficult to gather evidence in support of this theory.] J. C. Hancock¹ believes that defects in accommodative movements are responsible for most ocular headaches. It is a general law that the greater the ocular error, the less the tendency to headache; but both spasm and headache are produced more by moderate inequality of refraction, especially if it be astigmatic, and most of all by astigmatism with asymmetry of the axes. Errors of the extrinsic muscles produce headache, but less than the accommodative muscles, though more migraine, more giddiness, and more general distress. Another factor in headache is the tendency to loss of binocular vision; and so the rule: the stronger this tendency, the more headache produced by an error of the recti and oblique muscles. Brailley² and C. Wood³ say that 80% of all frontal headaches are causatively connected with the eyes. The pain is apt to be dull rather than neuralgic. The headaches that simulate ocular headaches are those connected with supranasal disease, malarial neuralgia, certain forms of head pain in neurotic men and women, and those associated with organic local disease, such as iritis, glaucoma, etc. The treatment depends largely upon the removal of the cause.

Eye-strain.—B. L. Dunn⁴ maintains that decentration of the lenses downward for reading is the most effective method of correcting the vertical prismatic effect of most reading lenses that cause eye-strain, and reports 3 cases of astigmatic and prismatic errors thus caused and relieved. He says: "It would seem from a study of these cases that the ordinary method of lens centration tends to give rise to a class of pseudo-insufficiencies which complicate the already difficult problem of muscle-balance. The whole matter of the relation of the muscles to vertical prism imbalance at the near-point deserves still more study, and it is my hope that by calling attention to the possibility of such pseudo-insufficiencies further work may bring out much which may prove of advantage to students of the ocular muscles."

Diagnosis of Astigmatism.—A. Langie⁵ has introduced a new card for the detection of astigmatism, which consists of alternating

¹ Med. Times, Feb., 1900.

² N. Y. Med. News, July 28, 1900.

³ Oph. Rec., Oct., 1900.

⁴ Arch. Oph., Sept., 1899.

⁵ Rec. d'Ophthal., Dec., 1899.

black and white blocks on a rotary axis connected on the reverse side of the card with an arrow which indicates the degrees of axis when the test-blocks are revolved into the position of greatest or least distinctness. The strips of cardboard containing the alternating blocks are 7 in number, being graded to correspond with the test-types of Snellen, so that the one which corresponds to the visual acuity of the individual case may be employed in that case. E. Jackson¹ proposes to correct astigmatism by first giving the strongest and then the weakest lens with which the patient can see clearly, using a specially devised test-card consisting of 3 parallel lines which subtend an angle of slightly more than one minute. The width of the 3 lines and 2 spaces for 6 meters should be 10 mm. The lines may be rotated to any axis as marked on an underlying card. The patient notes in which direction the lines look the clearest; then, starting from this position, the lines are turned first one way and then the other until they blur; half-way between lies the meridian of the greatest refraction, and at right angles to this, the meridian of least refraction, both of which may be corrected by suitable lenses.

Myopic Astigmatism.—Thomson² lays down the following rules for the treatment of myopia and myopic astigmatism: (1) Give total spheric correction, or as near to it as possible, and insist on its being worn all the time; (2) look carefully for low degrees of astigmatism and correct fully; (3) in high degrees of astigmatism give the total correction, to educate the retina, if possible.

The question of operation in high myopia seems to be well summed up by Timberman,³ who says that the degree of myopia requisite to justify operation is not alone the crucial indication. The comfort of the patient with correcting or partly correcting lenses; his capacity for work and self-support therewith; the condition and behavior of the other eye; and, above all, the character of the myopia, whether progressive or stationary—all these considerations must be weighed along with that of the degree. He analyzes 114 cases operated upon in von Hippel's clinic. His figures show that in myopia of 10 D. there resulted 7 D. of hyperopia, which is no gain when the loss of accommodation is taken into consideration. About 25% of the cases of 16 D. and 20 D. resulted in emmetropia. Experience is proving that in the presence of disease of the fundus the operation is justifiable. Muscular errors also seem to be improved by the instrumental aphakia. A. Bronner⁴ believes in removing the lens in high myopia in children, not with the object of procuring more serviceable vision, but in order to prevent increase of myopia. C. S. Bull⁵ would operate only in that form of myopia that has to do with progressive hereditary degeneration of the choroid and retina in addition to stretching of the eye at the posterior pole. Even under these circumstances he would not undertake discission of the lens if the patient is beyond middle life or if the myopia is

¹ Oph. Rec., Feb., 1900.

² Jour. Am. Med. Assoc., Nov. 4, 1899.

³ Med. News, Jan. 20, 1900.

⁴ Post-Graduate, Dec., 1899.

⁵ Lancet, Nov. 18, 1899.

less than 12 D. He says that the dangers of operation in high myopia are: (1) Intra-ocular hemorrhage; (2) detachment of the retina; (3) secondary glaucoma; (4) infection of corneal wound or iris, or both. *Contraindications*: (1) Extensive degenerative changes in retina and choroid in macular region; (2) detachment of the retina already existing; (3) membrane opacity in vitreous which indicates disease of choroid and of the walls of the blood-vessels; (4) previous loss of one eye, from whatever cause; (5) decided loss of transparency of the cornea from previous inflammation; (6) any form of contagious conjunctivitis, particularly trachoma; (7) advanced age of the patient; (8) myopia of less than 12 D. *Indications*: (1) Insufficient vision with glass to fulfil ordinary duties, and (2) rapid increase in myopia. In conclusion, T. Collins¹ says that removal of the lens in high myopia may now be considered to have passed the experimental stage and to have become, in suitable cases, a recognized and beneficial mode of treatment.

Astigmatism.—The diagnostic method described by Jackson² is somewhat similar to the common test for astigmatism. The apparatus consists of a rotating plate with 3 lines across it. The lines and spaces subtending the angle should be slightly over one minute. Close study of 1000 cases of ametropia in which a cycloplegic was used leads C. M. Culver³ to conclude that 6 drops of a 2.5% solution of homatropin hydrobromate at 5-minute intervals cause trustworthy paralysis of the ciliary muscle in the average healthy eye, usually in an hour after the first instillation, that will be quite as effective as the protracted use of atropin. E. C. Ellett⁴ agrees with the foregoing. He says that for the average case homatropin, properly used, is sufficient, but the best results are secured from the use of the gelatin discs made with cocain, after the formula of C. A. Wood. [For several years we used these discs, and found them of great service.]

Massage in the Cure of Refraction.—Because the eye is not made of bone, but of soft delicate tissue, H. W. Woodward⁵ thinks its form and size may be molded at will, and that refractive errors can be eliminated or modified by massage. [!] He reports several cases of myopia and hyperopia that he claims to have helped by decreasing or increasing respectively the refraction by massage with the little instrument devised by Dion, of Paris. "The instrument resembles a large trial-frame with 2 sliding cylinders, extending forward between which is a dial registering the position of the cylinders or the amount of pressure upon the eyes, the pressure being regulated by a thumb-screw." The test upon which he places the greatest reliance is that originated by Dion, which should show as 2 circles in distances varying according to acuteness of vision.

The causative relation of functional gastric disturbances to eye-strain is incontestable. Sick headache, anorexia, anemia, dyspepsia, and malnutrition of many types may be due to accommodative and muscular strain. "There is no truth of medical science better proved or more

¹ Practitioner, Feb., 1900.

² Arch. Oph., Jan. 1, 1900.

³ Ann. Ophth., Jan., 1900.

⁴ Jour. Am. Med. Assoc., Sept. 15, 1900.

⁵ Jour. Oph., Otol., and Laryng., Jan., 1900.

persistently ignored in daily practice than this of the intimate association of eye-strain and malassimilation.¹ C. M. Capps² reports 2 cases of epileptic eye-strain in girls of 8 and 9 years respectively. The first had compound myopic astigmatism, and the second compound hyperopic astigmatism, and both were relieved of the attacks first by atropin and then by glasses. There is in some cases a relation between facial mimic or habit-spasm and errors of refraction, and Stevens³ reports 10 cases, in 8 of which a correction of the refractive error was followed by a cure of the spasm. In 2 of the other cases no result was obtained, evidently because the nerve-centers had acquired a vicious habit which they did not lose after the removal of the cause. He advises that in every case the refraction and muscle-balance be carefully examined. The former should be determined under complete mydriasis and a full correction ordered.

MUSCLES.

Physiology.—H. Guillery⁴ has been experimenting on his own eyes as to the influence of various poisons on divergence and convergence, on accommodation and pupillary action, and on conjugate movements. He used alcohol, morphin, chloral hydrate, paraldehyd, sulphonal, trional, cocain, ether, chloroform, tea, and coffee. The two last-named showed no effect, sulphonal was uncertain, while the remaining drugs were all found to be either paretic or paralytic to one or more of the ocular movements.

Nystagmus.—Unilateral nystagmus is certainly rare. A. Duane⁵ reports an instance of it. The vertical movements disappeared entirely after the correction of a very high vertical astigmatism.

Enophthalmos.—Twelve cases of retraction movements of the eyeball (temporary enophthalmos) have been published, the last 5 by J. Wolff.⁶ They have all been found to have several features in common: The association of the retraction movements with a congenital defect in the motility of the retracted eye owing to aplasia of one or more muscles; this retraction is invariably induced by an attempt to rotate the eye inward; the palpebral fissure is narrowed during adduction; forward movement of the globe, with widening of the palpebral fissure during attempts to turn the eye outward, were present in 4 out of Wolff's 5 cases. He accepts Tuerk's fixation theory as the probable explanation. Tuerk's claim is that the paralyzed external rectus becomes practically an unyielding connective-tissue strand; hence the eye can yield to the traction of the internal rectus only by moving back into the orbit at the same time that it turns inward. A. N. Alling and H. Knapp⁷ report similar cases. From a study of the anatomy of the eye, along with the consideration of the cases reported in the literature, W. T. Shoemaker⁸ concludes that enophthalmos, except in very rare cases,

¹ Ed. in Phila. Med. Jour., Feb. 3, 1900.

² N. Y. Med. Jour., Sept. 16, 1899.

³ Am. Jour. Med. Sci., Jan., 1900.

⁴ Pflüger's Arch. f. d. gesamt. Physiol., Bd. LXXVII.

⁵ Oph. Rec., Oct., 1900.

⁶ Arch. Oph., May, 1900.

⁷ Arch. Oph., May, 1900.

⁸ Jour. Am. Med. Assoc., Sept. 15, 1900.

may be caused (1) by a paralysis of the muscular fibers in the check ligaments; (2) by atrophy or relaxation of these ligaments; and (3) by serious disturbances of any kind of the postocular orbital fascia.

Geo. J. Bull¹ is very fond of using the **stereoscope** in children who are just regaining binocular single vision after squint. He prefers the Holmes stereoscope, not only for determining the degree of ease or difficulty with which binocular single vision is maintained, but also for estimating the amplitude of fusion. The advantage is that the examination is conducted under circumstances closely similar to those surrounding the use of the eyes in ordinary reading or writing, for which reason he claims that we are much more likely to learn what really are normal and pathologic deviations. [This seems a point well worth attention.] From a study of the influence of abducting and adducting prisms on the estimation of distance with his own eyes, J. A. Lippincott² finds the only logical deduction to be that, given binocular single vision, prisms with bases outward diminish, whereas prisms with bases inward increase, the apparent distance of objects.

Hyperphoria.—B. L. Dunn³ emphasizes a good and oft-forgotten point. He says: "The most effective method of correcting the vertical prismatic effect of most lenses for reading (placed, as they are, high on the face) is to decenter them downward. Obviously, the prismatic effect is transferred *reversed* to distant vision, but this is partly overcome by altering the position of the head, and in reality gives little trouble." As a result of the study of the clinical facts in 150 hyperphorias, W. Reber⁴ finds (1) that hyperphoria occurs in about 1 out of 6 patients who seek the counsel of the ophthalmologist; (2) that it is present to the extent of a half-degree or more in 1 out of 3 refraction cases, and becomes worthy of especial attention in about 1 out of 5 refraction cases; (3) it occurs most frequently to the extent of about 1 degree, and is likely to be latent before the thirtieth year and manifest after that time; (4) the main symptoms are supraorbital, temporal, and occipital neuralgias, photophobia, drowsiness, and abnormal physical tire after prolonged near work; (5) a full quota of sleep, daily open-air exercise, and a well-regulated life are all highly important factors in the comfort of hyperphorias; (6) convergence training (if convergence be insufficient) and convergence repression (if convergence be excessive) frequently relieve hyperphoric symptoms entirely; (7) the vertical prism is of great value, and such corrections will be of service in about 50% of all selected cases, or, (8) failing in all this, section of some one of the vertical muscles may be considered. When there is intrinsic hyperphoria of 2 degrees or more, about 1 out of 20 hyperphorias will profit more by tenotomy than by any other treatment. From 2 to 3 degrees is likely to be the amount permanently gained by tenotomy. W. A. Brailey,⁵ in his address before the British Medical Association, contended that of all ocular errors espe-

¹ Oph. Rev., Nov., 1899.

² Oph. Rec., Oct., 1900.

³ Arch. Oph., Oct., 1899.

⁴ Tr. Sec. of Ophthal., Am. Med. Assoc., 1900.

⁵ Oph. Rec., Oct., 1900.

cially effective in causing headaches, muscular errors are by far the most important, though they are obviously of ultimate nervous origin. He lays down a very good axiom: namely, the stronger the tendency to binocular vision, the more intense the headache produced by a muscular error.

Strabismus.—Priestley Smith¹ advocates the rational treatment of strabismus at a very early age. By this he means the use of atropin and spectacles, cultivation of vision of the squinting eye by suppressing the fixing eye with a pad, and finally tenotomy. He has operated in the third year of life. In every case the child should be examined soon after the strabismus begins, and he enthusiastically urges that this principle in the treatment should be urged by the ophthalmic workers upon the whole profession in order that it may reach the public. Before doing tenotomy in any case A. Duane² prepares the patient by exercises of the eye muscles and by repeated attempts to secure binocular vision and the recognition of diplopia. Immediately after operation the patient is allowed to go about as usual, and is encouraged to practise the use of both eyes together for all ordinary vision. No bandages are applied, and deep sutures are avoided when possible. Occlusion of the better eye is not done until some considerable time after the operation. There is practically no danger of infection or of exciting inflammation by this after-treatment. "It makes little difference how we do a tenotomy, but it makes a great deal of difference how we treat the eyes afterward." [This method resolves itself into making the best possible adjustment of the peripheral or ocular end of the apparatus and then trusting to the cerebral cortex to do the rest. It is good sound teaching.]

Operation.—D. B. Roosa³ is enthusiastic over the results of Panas' operation for strabismus. This operation consists essentially in stretching the muscles before the division and dividing the interni and externi, as the case may require. Roosa reports 36 cases, of which 31 fell within his own experience. Perfect results (parallelism of the eye) were secured in 32 out of the 36 [an exceptionally large proportion]; the other 4 are still under observation, and ultimate cure is hoped for. The dread of overeffect from both stretching the muscles and afterward dividing them is, he believes, unwarranted. M. Averbach⁴ used the Javal ophthalmometer to measure the defect of astigmatism and the direction of its chief meridians before and after several squint operations. In 10 cases of tenotomy of the internal recti the difference of refraction between the two principal meridians increased, that of the vertical meridian generally increasing while that of the horizontal diminished. The angles of the principal axes were changed from 6 to 18 degrees. In 5 cases of tenotomy of the external recti the astigmatism was diminished in 1 case and increased in the other 4. Hemorrhage during tenotomy for strabismus may in rare instances imperil the integrity of the eye and its adnexa. M. R. Wilson⁵ reports a case of this kind seen in Stephenson's clinic. The conjunctiva was enormously chemosed, the

¹ Lancet, Sept. 23, 1899.

Post-Graduate, Mar., 1900.

² Med. News, April 28, 1900.

⁴ Med. Rev., May, 1899.

⁵ Lancet, July, 1899.

lids were distended, and the eye was pushed forward in the orbit and partly immobile. With rest and pressure bandages for a month, recovery ensued. The effect of the tenotomy was practically *nil*.

Palsies.—That **monocular diplopia** may be the result of disturbed cerebral function is shown by a case of E. B. Heckel's.¹ A young married woman complained for a week of intense headache. Then for 2 consecutive days she had diplopia with the left eye. There was no error of refraction and no spasm of the ciliary muscle—the usual explanation for monocular double vision. The author attributed it to “a sensory phenomenon of cerebral origin brought about by the toxins of typhoid germs.” In this case it was an early symptom of typhoid fever. Geoffrio and Guise,² in studying a case of obscure palsy of all the extraocular muscles, found after searching examination that the phenomena were purely hysteric in origin. Abadie³ reports 2 interesting hysteric cases. The first patient was a nervous woman, who had been subjected to a sudden emotional shock, and after this was subject to attacks in which the eyelids became closed tightly without tremor and the patient took an attitude of natural sleep. No treatment seemed to be of any avail. The second patient was a girl of 13 years, who, without any apparent cause, would experience sudden attacks of dropping of the eyelids, occurring at varying intervals, chiefly in the evening. The eyes were normal. She was a markedly hysteric subject. In both these cases the attacks would come on after any emotional excitement, and the particular peculiarity to which Abadie especially directs attention was that they were intermittent, while hysteric ptosis is commonly constant. In a 27-year-old patient who had suffered from influenza 2 years previously, and along with it double vision, Vereshbiaguin⁴ saw palsy of the superior oblique muscle following a second attack of *la grippe*. The author is inclined to ascribe it to a nuclear lesion. J. W. Stirling⁵ recites the history of a girl of 14 who presented recurrent oculomotor palsy of the left eye. There was a hereditary tendency to nervous instability and a history of repeated palsies from early childhood. The author thinks that there was an organic lesion in this case, probably in the nerve-trunk.

THE EYE IN GENERAL DISEASE.

Juler⁶ emphasizes the value of eye symptoms and eye examinations in general diseases. He thinks that the value of the ophthalmoscope as a means of diagnosis in general diseases is not sufficiently appreciated by the general practitioner and recommends its more constant use. [The importance of ophthalmoscopic examinations can hardly be overestimated, but the general practitioner is not qualified for this examination. The opinion of the man who is not an expert and does not keep in constant practice is of no value in just those cases in which the fun-

¹ Phila. Med. Jour., Mar. 3, 1900.

² Hungarian Messenger of Ophthal., Dec., 1899.

³ Rev. d'Méd., Dec. 10, 1899.

⁴ Russian Military Med. Jour., Oct., 1899.

⁵ Montreal Med. Jour., Oct., 1899.

⁶ Lancet, Feb. 3, 1900.

dis conditions are uncertain and a reliable ophthalmoscopic examination would be of greatest service. The general practitioner has not the time nor the opportunity to keep himself in training with the ophthalmoscope, and consequently has no confidence in his own ophthalmoscopic diagnosis, more's the pity.]

The Pupils in Sleep as Compared with Pathologically Small Pupils.—W. H. Robey¹ says that the differential diagnosis between healthful sleep and the narcosis of drugs may be made by carefully noticing the size of the pupil. In the former the pupil instantly dilates when the individual is aroused, and in the latter it retains its small diameter. In the course of the bromid treatment of epilepsy, when the drug is well tolerated, the pupils are of normal size and react properly to light and accommodation. "If the dose is increased," says G. de la Tourette,² "a moment arrives when the pupils dilate and grow sluggish in reaction." Pushing the drug still further, the pupils dilate *ad maximum*, and do not react at all. Beginning dilation of the pupil is the sign of physiologic limit in each case. Tourette claims that even in persons highly sensitive to bromid, it is possible cautiously to work up to and hold at the physiologic dose if the pupils are constantly watched.

While the detection of optic neuritis is of grave importance in diagnosing brain disease, R. T. Williamson's and E. Roberts'³ results show that in certain cases of double optic neuritis with headache considerable caution is necessary before coming to a conclusion as to the exact nature of the disease. When lead-poisoning, otitis media, kidney lesions, and blood dyscrasias have been excluded, and when the chief symptoms are headache, double optic neuritis, and vomiting, and in the absence of localizing symptoms, they believe the cause to be syphilitic disease of the brain. In such cases a provisional diagnosis of tumor in the cerebellum, temporosphenoidal lobe, or prefrontal region often proves correct. Out of 100 cases of double optic neuritis with headache studied by them, 19 could be placed in this group.

Westphal⁴ describes a newly observed reaction of the pupil in those cases in which the pupil becomes narrower when the lids are suddenly opened after having been forcibly closed. Piltz⁵ said that the same phenomenon could be observed if an effort were made to close lids that were held apart by force, and that it occurred also in pupils of healthy persons, while Autal⁶ believes that the reflex may occur as a prodrome of the Argyll Robertson pupil.

Attention is drawn to the ophthalmoscopic indications of preexistent active syphilis by Antonelli,⁷ who offers the following list of stigmata: remains of a previous neuritis, retinal vascularity, chorioretinitis, or simple pigmentary disturbance of the pigment epithelium. The extreme frequency of pigment disturbances in the eye-grounds is an incontest-

¹ N. Y. Med. Jour., Feb. 10, 1900.

² Lancet, May 12, 1900.

³ Neurol. Centralbl., No. 6, 1899.

⁴ Semaine méd., Oct. 3, 1900.

⁵ Neurol. Centralbl., No. 4, 1899.

⁶ Neurol. Centralbl., 19 Jahrg, 1900.

⁷ Arch. di Ottal., vi, No. 8, 1899.

able evidence of syphilis that might be much utilized in deciding the origin of doubtful cases of general paralysis, tabes, etc.

Diphtheria.—H. Friedenwald¹ found the sequels in a case of diphtheria to be paralysis of both external recti muscles, the palatal muscles, and the muscles of the neck and those of the upper and lower limbs. The patient had been treated liberally by serum therapy, which, according to Escherich² and Gutmann,³ induced paresis; but according to Greef,⁴ the proper explanation is found in the greater ratio of recovery in severe cases because of the serum treatment. Friedenwald's patient recovered.

Juler's⁵ method for baffling the malingerer is as follows: Having found the pupils equal, active to light, and normal in size; having ascertained the absence of all such ametropia as would cause blindness; and having examined the fundus ophthalmoscopically and proved it healthy, an empty spectacle-frame capable of holding lenses is placed upon the patient's face and he is told to read illuminated test-type in a dark room. Then a strong cover-glass is placed in front of first one eye and then the other, and he is asked to read. He does not know that the glass obscures his vision; indeed, he probably thinks that it benefits his sight. As he is enjoined to keep both eyes open he does not know which eye he is reading with, and soon proves to the medical man's satisfaction that he can read with both. [This test is based on the principle of that suggested by Harlan. Instead of a cover-glass Harlan uses a strong convex spheric lens, the focal length of which is too short to permit of reading at the usual reading distance. It is undoubted that the recent legislation in behalf of workmen injured while in their master's employ has much increased the simulation of diseases in the United Kingdom, especially of those surgical conditions which by wholly debarring the sufferer from earning his livelihood would entitle him to a large pension.] C. A. Veasey⁶ brings out well, in the record of a case of a girl of 11, the distinction between malinger-ing and hysteric amblyopia. That her affection was the latter is shown by her age, her disposition, the anesthesia of the cornea and conjunctiva, the reversal of the color-fields, and the fact that no effort was made to conceal the vision after it had been established. Borel⁷ states that **traumatic hysteria** in the visual sphere is far more frequent than statistics would lead us to believe. The principal stigmata are monocular diplopia, spastic strabismus, mydriasis, and photophobia. These phenomena belong most frequently to the grave forms of hysteria, even when they appear in persons who have never before shown such dispositions. "Hysteric strabismus," he says, "is identical with that form of squint produced by hypnotic suggestion."

Typhoid Fever.—G. E. de Schweinitz⁸ says that there are no ocular lesions characteristic of typhoid fever, in the sense, for

¹ Phila. Med. Jour., Sept. 9, 1900.

² Diphtherie, Croup Serumtherapie, Leipzig, 1895.

³ Inaug. Dissert., Berlin, 1896.

⁴ Phila. Med. Jour., Feb. 17, 1900.

⁵ Ann. d'ocul., April, 1900.

⁶ Deut. med. Woch., 1896, p. 592.

⁷ Jour. Nerv. and Ment. Dis., Aug. 1, 1900.

⁸ Phila. Med. Jour., Mar. 3, 1900.

instance, in which certain forms of retinitis are pathognomonic symptoms of some varieties of so-called Bright's disease. Nevertheless a number of eye diseases may accompany or follow typhoid fever, precisely as they may be part of the symptomatology or sequels of other febrile affections which greatly depress or alter the nutrition of the patient. These ocular disorders have been recognized from the beginning of the last century, although necessarily in the earlier observations it is next to impossible to distinguish between typhus and typhoid. The diseases are due either to the bacillus of typhoid or to the feeble resisting power of the patient from the exhaustion characteristic of the disease. He mentions catarrhal conjunctivitis, phlyctenular ulcer, sloughing keratitis, inflammation of the uveal tract, cataract, opacities of the vitreous, retinal hemorrhages, anesthesia of the retina, optic neuritis, optic nerve atrophy, paresis of the pupil and accommodation, extra-ocular muscular paralysis and functional derangements, thrombosis of the orbital veins, orbital cellulitis, and asthenopia as the usual complications.

Anemia.—Lopez ¹ recognizes a peculiar kind of anemia among the reconcentrados of Cuba from lack of wholesome food, the ingestion of indigestible substances, and wretched hygienic conditions. The anemia affected the eyesight to such an extent that the condition was known among physicians as "blockade amblyopia." It affected all races, sexes, and professions, but was never observed in those under 20 years of age. Most patients were restored after a month of good food and tonics. There was first congestion and then pallor of the optic nerve, without alteration of the vessels, retina, or any portion of the interior of the eye.

Locomotor Ataxia.—Hawthorne ² believes, after a study of 30 cases, that he is justified in concluding that the existence of otherwise unexplained ocular lesions should arouse a suspicion of locomotor ataxia. Either atrophy of the optic nerve, ocular paralysis, or Argyll Robertson pupil may exist for a long time as an isolated symptom. If more than one of these be found, it is more probable that the cause is locomotor ataxia. Sometimes minor evidences of spinal disease may be found upon careful examination, and thus the suspicion is increased. Occasionally cases which have for a long time had only ocular symptoms suddenly and rapidly develop the characteristic spinal symptoms. But although these ocular symptoms may arouse a suspicion of tabes, the diagnosis can not be established at once, as the eye symptoms may remain for years the only indication of the disease.

Acromegaly.—W. A. Holden ³ describes the gross changes in the chiasm in 3 cases of acromegaly: "The enlarging pituitary body compresses the posterior portion of the chiasm. Following this, the posterior and middle portions of the chiasm are flattened and forced upward, thus becoming separated from the anterior portion, which is protected from pressure by the bone beneath it. Later, with this tilting upward

¹ Arch. de la Policlín. (Havana), Jan. 28, 1900.

² Brit. Med. Jour., Mar. 3, 1900.

³ Arch. Oph., Mar., 1900.

of the chiasm posteriorly and the forcing forward of the anterior wall of the pituitary fossa, the anterior portion of the chiasm is encroached upon by the pituitary body and arched directly forward. Finally the chiasm may be cut through completely."

In epidemic cerebrospinal meningitis W. Chatham¹ found the following ocular complications: catarrhal conjunctivitis (in the beginning), edema of conjunctiva and lids from orbital cellulitis, paralysis of motor nerves from basal affections, conjugate deviations, plastic and purulent inflammation of the uveal tract, hyperemia, and papillitis followed by optic nerve atrophy. In 23 cases of epidemic meningitis B. K. Chance² noticed among the early symptoms photophobia, catarrh of the conjunctiva, diminution of central vision, diplopia, ptosis, facial paralysis, optic neuritis, and congestion of the fundus. There was no case of keratitis or iritis, loss of transparency of the lens, or gross acute changes of the retina or choroid.

Autointoxication.—A. A. Hubbell³ thinks that most ocular diseases not arising from injury or infection from without are caused by autointoxication, self-poisoning, or by autoinfection from direct germ invasion. He traces iritis to the toxic agent of gout, rheumatism, or syphilis; tenonitis to rheumatism's morbid agent; retinitis to poison in the blood from albuminuria, diabetes, syphilis, etc.; optic neuritis to the toxin of an intracranial growth or of nicotin and alcohol; sympathetic inflammation through poisoning of the uveal tract from materials in the general circulation. Much will be accomplished in therapeutics when we learn how to eliminate or antidote these poisons.

Nephritis.—S. West⁴ assumes to trace a connection between the exudative inflammatory albuminuric retinitis with acute neuroretinitis and parenchymatous nephritis, and the degeneration consisting in white patches and hemorrhages in the retina and the more chronic granular forms; the former toxic in origin, the latter consequent upon vascular changes. T. R. Pooley⁵ quotes Possauer to the effect that among subjects of albuminuric retinitis all men of the poorer class seen at the clinics die within 2 years (in other words, 100%), while among women of the same class the percentage is only 68. In private work the death-rate within 2 years is 59 for men and 53 for women. The difference is ascribed to the more noxious influence under which men live. He looks upon small doses of mercuric chlorid and of iron tannate as of value, the latter probably reducing the liability of recurrent hemorrhages. He also emphasizes the importance of inducing labor in the albuminuric retinitis of early pregnancy. (See abstract of Derby's paper, YEAR-BOOK, 1900.) C. S. Bull⁶ concludes his study of ocular hemorrhage as to prognosis of life thus: Hemorrhages into and beneath the conjunctiva are of little importance in the young. In the aged they point to a general weakened condition of the vascular walls. Into the interior of the eyes they are always of prognostic significance, denoting angiosclerosis, and

¹ Phila. Med. Jour., July 15, 1899.

² Buffalo Med. Jour., Jan., 1900.

³ Med. Rev. of Rev., Sept. 19, 1900.

⁴ Columbus Med. Jour., Feb., 1900.

⁵ Lancet, Aug. 19, 1899.

⁶ Med. Rec., Feb. 3, 1900.

point to the probable occurrence of central apoplexy. Recurrent retinal and subhyaloid hemorrhages in the young are of slight prognostic importance, but those into the vitreous are grave, and point to general vascular degeneration. In chronic nephritis and in diabetes intraocular hemorrhages point to a fatal ending.

Toxic Amblyopia.—Polkinhorn¹ believes that in tobacco and alcohol amblyopia alcohol plays a minor part in the nosology, and that the absorption of tobacco is responsible. When there is no actual scotoma or contraction of the visual field and the patient is willing to obey directions, the prognosis is good.

Vaccination.—Von Forster² (Nürnberg) has observed 4 instances of vaccine infection of the eyes of attendants upon freshly vaccinated children, attributable to the extraordinary activity of this year's virus. The pustules were located in part on the lids and the conjunctiva. The cornea escaped. Confluence occurred in one case and a purulent discharge ensued. Recovery was prompt in each patient and there were no sequels.

Hereditary Optic Neuritis.—R. D. Butten³ records hereditary optic nerve atrophy occurring in 3 brothers, all plumbers. He believes that the lead used in their work was a sufficient addition to their hereditary predisposition to bring about optic atrophy.

Optic Atrophy.—L. Buchanan⁴ mentions the frequent association of enlargement of the cervical glands with optic nerve atrophy or moderately acute optic neuritis. He believes that there is here evidence that a former tubercular meningitis or new growth may later produce optic neuritis. Lopez⁵ reports blindness after unaccountable severe vomiting of blood occurring in a healthy man of 45. Optic atrophy came on very rapidly after the loss of blood.

Exophthalmos and Enophthalmos.—After an extended trial in producing enophthalmos and exophthalmos experimentally, W. Edmunds⁶ says that while exophthalmos may be benefited by excision of the cervical sympathetic, and while the operation has been tried several times in man, the results are not very satisfactory, at least so far as the general disease is concerned. In a case of pulsating exophthalmos due to the formation of a communication between the internal carotid and the cavernous sinus, A. Mills⁷ performed a ligation of the common carotid. The symptoms disappeared in 3 weeks, and the patient died suddenly soon after; the cause of death was unknown.

La Grippe.—Pechin⁸ observed 2 cases of large corneal ulcer and 1 of muscular asthenopia following grippe.

¹ Oph. Rec., July, 1900.

² Ann. Ophth., July, 1900.

³ An. de Ophth., Sept., 1899.

⁴ Australas. Med. Gaz., Sept., 1899.

⁵ Med. News, Sept. 15, 1900.

⁶ Ann. Ophth., July, 1900.

⁷ Brit. Med. Jour., Feb. 8, 1900.

⁸ Rec. d'Ophth., Mar., 1900.

OTOLOGY.

By CHARLES H. BURNETT, M.D.,
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Acquired Atresia and Stricture of the Auditory Canal and Its Treatment.—H. Schwartze¹ gives as the usually accepted causes of acquired atresia of the auditory canal chronic purulent otorrhea (especially that following scarlet fever), wounds, burns, and lupous, diphtheric, and syphilitic ulcerations. To these he adds a new cause, arising during the last 10 years: viz., unskilful operation on the mastoid process. In the latter instance the atresia is the result of the laceration of the posterior wall of the cutaneous canal by a spicule of bone or by the chisel of the operator. If in the subsequent treatment of the case this injury to the auditory canal is disregarded, and the granulations at the point of injury are not held in check by tampons and cauterizations, a stricture will occur. If the opposite wall of the canal has been injured and granulations have formed there, the two granulation surfaces approximate and adhere, and a cicatricial atresia is formed. For the relief of the atresia or stricture of the auditory canal Schwartze has devised an operation consisting of the following steps: The usual incision is made behind the auricle, as for a radical mastoid operation, and the auricle and the fibrocutaneous auditory canal are detached from the posterior wall of the canal, until the stricture is reached. The latter is cut out of the canal and the lumen once more opened. If hyperostosis of the canal at or beyond the stricture is present, it is chiseled away, and the membrane or its remnant and the middle ear and its contents are inspected. The latter region is treated as in the radical Stacke operation; if the condition of the middle-ear cavities demand it, the posterior wall of the bony auditory canal is chiseled away, the fibrocutaneous auditory canal is split longitudinally or horizontally, and the upper and lower flaps thus formed at that point are sutured into the opening previously made in the posterior bony wall. The upper flap of the cutaneous wall is sutured to the upper angle of the posterior auricular wound and the lower flap into the lower angle of the mastoid wound, and a retro-auricular opening is thus made for future treatment of the new-made external auditory canal cavity. In some instances the posterior wall of the cutaneous canal is simply split horizontally, and the flaps are pushed into the mastoid wound and sutured there, after which the retro-auricular wound is united by primary suture and no retro-auricular opening formed.

¹ Arch. f. Ohrenh., vol. XLVII, p. 71, and vol. XLVIII, pp. 98 and 261.

In the 11 cases operated upon, the stricture operation (detachment of the auricle and cutaneous canal and excision of the stricture or atresia regions) was in 9 cases united to the radical operation of opening all the middle-ear cavities, and only in 2 instances was there no such bone operation. The result in these two cases, of recurrent narrowing of the reinstated lumen of the canal, raises the question whether it is not advisable, even in those cases in which an isolated cicatricial closure of the canal occurs, and when the nature of the disease of the parts beyond the stricture does not demand an operation on the mastoid bones, nevertheless to make it a rule to widen the auditory canal by the concentric removal of flat layers of bone from its posterior wall. In any event a study of the table of cases presented by Schwartze shows that in them, permanent cure of the stricture of the canal was obtained only in those cases in which the stricture operation was associated with the radical bone operation, usually without the permanent retro-auricular opening. When we consider the fact that in most cases the operation revealed caries behind the stricture, the latter being of long standing, it is surprising that in such cases intracranial complications from retention of pus had not more frequently arisen. The stricture operation resulted in curing the chronic suppuration in 7 of the 11 cases, in 1 instance the result is unknown, and in 2 cases the suppuration continued. The stricture (or atresia) was cured in 7 cases, in 1 instance there was a relapse, and in 3 cases there was a partial return of the stricture. Schwartze claims that the operation for stricture and atresia he has recently proposed is a decided improvement over the old methods of operating on the stricture through the external auditory meatus. However, as Schwartze points out, there exists at the point of the stricture a tendency to the formation of new bone, favoring a renewal sooner or later of the stricture, and depending upon causes unknown at present. Perhaps this persistent tendency to hypertrophy of the bone is the result of a chronic irritation in the skin and bone, brought about by the stagnation of secretions confined behind the stricture. To decide this question Schwartze suggests that hereafter the excised integument of the constricted auditory canal be subjected to histologic investigation. Even in those cases in which the stricture consisted of cicatrized skin, without hypertrophy of the bone, a tendency to recurrence existed. However, if the operation cures the suppuration behind the stricture, life is not endangered by a recurrence of atresia of the canal. The better results of the new stricture operation emboldened Schwartze to conclude that it should be preferred in all cases to the old method of operating through the external meatus. In one case, if the old method had been employed, the maxillary joint would have been opened, the operator would have been obliged to desist from going further, and the serious disease beyond would have escaped detection.

Bacteriology of Acute Otitis Media.—E. Leutert¹ considers this subject under 3 heads: (a) Acute primary inflammations of the middle ear; (b) acute secondary inflammations of the middle ear; and

¹ Arch. f. Ohrenh., July and Sept., 1899.

(c) complications in the mastoid region, including sinus thrombosis. He states that it has been shown by the investigations of Löwenberg, Fränkel, Simmonds, Zaufal, and many others, that genuine primary acute median otitides may be excited by the following germs: (1) The pneumococcus of Fränkel; (2) *Streptococcus pyogenes*; (3) the pyogenous staphylococci; (4) the pneumobacillus of Friedländer; (5) *Bacillus pyocyaneus*; (6) *Meningococcus intracellularis* of Weichselbaum-Jaeger, as in cases described the aural suppuration was the primary disease from which the cerebrospinal meningitis originated; (7) the actinomyces. The chief producers, however, of primary acute otitides are the pneumococcus of Fränkel, the streptococci, and the staphylococci. The other germs occur only exceptionally.

Secondary (Acute) Otitides.—Leutert states that the observations of Marie Raskin and of Blaxall have shown that in scarlatinous otitis media the streptococci are the chief causative factors. The causative factor in the otitis of measles has not yet been definitely made out. The primary factor in diphtheric otitis is still not clearly demonstrated. In influenzal otitis pneumococci, and then streptococci, seem to be the causative agents. The otitides of typhoid fever are not caused by any special germ. They occur in the later stages of the disease when the weakened body of the patient is a ready prey to various germs. From observations of Kroening's,¹ it is admitted by Leutert that the gonococcus can excite a primary suppuration in the middle ear.

Complications.—There are few special bacteriologic investigations of the causes of aural complications, like mastoid empyema. So far as these have been conducted it may be considered that pneumococci and streptococci possess nearly an equal ability to set up an acute empyema of the mastoid. The few bacteriologic investigations in pyemia of otitic origin tend to show that the streptococcus is the efficient agent.

In Leutert's own bacteriologic investigations in acute and chronic purulent otitis media his first statement of practical importance is that the hearing is less reduced in cases of pneumococcic infection of the middle ear than in cases of streptococcic infection of that organ. The results of Leutert's investigations are summed up as follows: (1) In 63 cases of mastoid empyema after acute aural suppuration the *streptococcus alone* was found upon culture 38 times, with impurities once and in conjunction with a bacillus once. The pneumococcus was found pure on culture 11 times, once with some uncertainty and once with uncertainty. *Staphylococcus albus* was found pure 5 times, with pneumococci perhaps in one case. *Bacillus tuberculosis* was found pure in 2 cases, and once with other not closely determined micro-organisms. In one case the culture remained sterile. (2) In 10 cases of epidural abscess following acute purulent otitis media the streptococcus was obtained pure in 2 cases; the pneumococcus pure 6 times, and in 1 case with uncertainty, as the guinea-pig used for culture experiment did not react. *Staphylococcus albus* was obtained pure in one case.

Otitis Neonatorum and Catarrhal Diseases of the Middle Ear

¹ Centralbl. f. Gynäk., 1893.

in General.—Leutert thinks that though the pathogenic germ of otitis neonatorum can not be demonstrated clearly, this disease is probably “a suppuration excited by the entrance of amniotic fluid and its ingredients into the drum-cavity during parturition,” as first claimed by Aschoff.¹ In acute catarrhal inflammations in the middle ear it seems that streptococci and pneumococci play the prominent part, while in chronic purulent catarrhs the staphylococci are the chief pathogenic factors.

Otitis Media in Early Childhood.—A. Barth² draws attention to the fact that in young children the ear is often affected at the same time that other diseases are present, and that there may be a causal relation between the two conditions. He is impressed with the fact that recent records show that of 600 children examined before and after death, 80 % were found to have a lesion of the middle ear. He states that though the middle ear may be inflamed and contain pus, the membrana often shows little or no alteration except a bulging at some point; it may or may not be injected. He believes that infection of the ear takes place from the nasopharynx through the Eustachian tube: *e. g.*, by water forced into this space in bathing and in the use of the nasal douche. He also maintains that spontaneous rupture of the membrana is the rule in otitis in adults, while in young children it is the exception. [This is probably due to the fact that in very young children the membrana is much thicker than in older ones.] “The influence exerted upon the general system in cases of otitis media is greater in children than in the grown. They often lose their appetites and have other digestive disturbances, which, if the trouble lasts long enough, end in general marasmus and death. Symptoms of some other trouble to which the ear affection may be secondary often mask the symptoms of the middle-ear inflammation entirely; again, the middle-ear trouble may run its course without affecting the general condition of the child.” [The latter may be true of a recognized ear disease, characterized by a discharge: *i. e.*, by an external symptom. But the unrecognized or the unsuspected ear disease is often the cause, not the effect, of loss of appetite, digestive disease, marasmus, and death.] Barth concludes by saying that “from what has been said of the frequency of middle-ear inflammations in children, and of the *absence of symptoms* in many instances, we can conceive of the rationale of a daily examination of the ears of *all unwell* infants, from the beginning of their trouble to the end of convalescence. In the absence of otorrhea there is no symptom by which inflammation of the middle ear can be recognized with any degree of certainty, so that the children are often treated for other infantile diseases when an *inspection* of the drum might have led to a diagnosis.”

Otitis Media in All Grave Diseases of Infancy.—E. H. Pomeroy³ has written a most important article with the foregoing title. He says at the outset: “My idea is that most of the diseases of infancy are more positively, more comprehensibly, more demonstrably, infectious from definite bacterial infection than we can easily prove in adults, or if

¹ Zeit. f. Ohrenh., 1897.

² Arch. of Otol., Oct. and Dec., 1899.

³ Boston M. and S. Jour., Jan. 18, 1900.

toxemic from bacterial growth, also more definite; and that the pharyngeal postnasal chamber is the more easily comprehensibly distributing point for infection to the middle ear, the brain, the lung, the stomach, and the intestines; and the middle ear an incubator and generator promoting general toxic disturbance in very many cases of localized infectious diseases. In the face of these facts¹ it seems to me that we can not conscientiously attend any grave disease in children without the most careful examination as to the condition of the ear." Pomeroy then gives notes of 5 cases with symptoms of gastro-enteritis and pneumonic complications, in all of which otitis media was found to be the true cause of the severe general symptoms. The first case proved fatal, the ear not having been suspected as the cause of disease. The other four recovered promptly after paracentesis of the membrana tympani. He concludes by saying that the policy of waiting for "external" ear symptoms to arise in infants is entirely unreliable, because in Ponfick's 100 fatal cases spontaneous rupture had occurred in less than 9% of the series.

Facial Nerve in Ear Diseases.—S. Tomka² has presented the best summary of information on this important subject. The anatomic peculiarities in the aural region favoring facial paralysis are shown to be dehiscence in the Fallopian canal, usually just above the oval window of the vestibule (the entrance of the stylomastoid artery into the facial canal), the variation in the course of the facial canal conducive to operative paralysis, variation in the width of the facial canal, variation in thickness of the wall of the facial canal, and congenital malformations of the temporal bone. Into the etiology enter (1) exposure to cold; (2) local diseases of the entire organ of hearing, such as diseases of the auricle, auditory canal, and middle ear, like serous and mucous catarrhs, acute inflammation of the middle ear, acute purulent otitis media, and especially chronic purulent otitis media; (3) traumatism; (4) new growths in the organ of hearing; (5) tumors at the base of the skull; (6) paralyzes resulting from intracranial lesions of otitis. Concerning the anatomic and histologic changes in the facial nerve occurring in paralysis thereof very little is known. The changes that have been demonstrated are hyperemia and swelling of the neurilemma from infiltration and growth of connective tissue; purulent infiltration of the neurilemma and of the facial nerve in purulent inflammation of the middle ear and caries of the walls of the drum-cavity; atrophy of the facial nerve; absorption thereof in consequence of induration and compression or through pressure from hyperostosis of the facial canal; degeneration from induration of the nerve; and total destruction of the nerve.

Symptoms.—Paralytic symptoms in the tract of the facial nerve are more noticeable in peripheral affections than in central affections of the nerve. As prodromes of facial paralysis may be named pain in and behind the ear and corresponding side of the face in the line of the auricularis magnus nerve and second branch of the trigeminus. Sometimes there

¹ Ponfick's tables, Berl. klin. Woch., Sept. and Oct., 1899.

² Arch. f. Ohrenh., April 19, 1900.

are tinnitus and abnormal sensations of taste. The secretion of tears is also arrested at times, and the sense of smell may be diminished because of the dryness of the mucous membrane of the nose by reason of defective lacrimation. The paralysis may affect all or only some of the branches of the facial nerve. A frequent symptom of facial paralysis is paralysis of the soft palate on the affected side. This symptom has never been explained, as the experiments of Rethi (1893) show that the soft palate is innervated by the vagus. Paralysis of the facial is usually unilateral, though a few cases of ambilateral facial paresis have been reported. Alterations in taste are not uncommon, consisting in diminution or loss of this sense in the anterior two-thirds of the tongue on the affected side. Subjective sensations of sound occurring in connection with facial paralysis, associated with evident disease of the middle ear, must be ascribed to the latter cause. If there are no evidences of disease in the middle ear, the subjective noises in the ear in such cases must be referred to an affection of the nerve in the Fallopian canal productive of a condition of irritability, as in rheumatic paralysis of the facial nerve. It is also plain that the systemic poisons productive of facial paralysis may also affect the labyrinth, or disease of the facial nerve in the Fallopian canal may also pass up into the labyrinth and produce subjective noises in the ear. Alteration in hearing accompanying facial paralysis without demonstrable middle-ear disease has been attributed to paralysis of the stapedia branch of the facial nerve, whereby the antagonism of the stapedius muscle to the tensor tympani muscle is overcome, the stapes is forced unduly inward by the latter muscle, and deafness results. The hyperacusis sometimes observed with facial paralysis is referable to irritation in the terminals of the acoustic nerve. Clonic spasms in the facial tract occur oftenest in those cases in which there is *no profound lesion* of the nerve. The secretion of saliva may be diminished in facial paralysis. Facial paralysis in aural diseases comes about either by degrees or with marked variations. In some cases total facial paralysis comes suddenly, either with or without prodromes. Lessening of the paralysis occurs, usually with improvement in certain branches first, and then later in others. Recovery may never occur in some branches, as, for example, in that of the nasolabial fold or of the levator palpebrarum. In children facial paralysis may lead to arrest of development of the face, and sometimes to atrophy of the muscles of the face. Recurrence of facial paralysis after recovery has been reported in a few instances.

Diagnosis.—The diagnosis of facial paralysis is not difficult, on account of the facial distortions induced. Differential diagnosis between central and peripheral paralyses is not easy to make in the early stages and in the absence of any objective lesion in the organ of hearing. It is also difficult when paralytic symptoms appear in the tracts of other cranial nerves, and also when the simultaneous brain symptoms indicating a probable central lesion of the facial nerve are absent. Electric examination shows that the degenerative reaction usually occurs only in peripheral paralyses, while in central paralyses electric excitability is

completely maintained if the facial nuclei in the pons are not implicated. Further, in central paralysis the sense of taste in the anterior two-thirds of the tongue is unaltered, closure of the eye is usually maintained, and the forehead remains movable, whereas these functions are usually impaired in peripheral paralysis of the facial nerve. Facial paralysis caused by the growth of a tumor at the skull base into the internal auditory canal is usually accompanied by total deafness and prominent characteristic brain symptoms, rendering a differential diagnosis easy. It is not easy to locate the precise seat of a peripheral paralysis of the facial nerve. Nonsecretion of tears indicates a lesion of the geniculate ganglion or of the nerve beyond it. According to Rosenthal, a considerable diminution or a loss of neuroelectric and myoelectric irritation is characteristic of a compression of the nerves in the Fallopian canal. Facial paralysis caused by pressure comes on slowly, while that caused by destruction comes on suddenly and is total. The former gets better as the ear disease passes off. The latter, of course, remains total. In the milder forms of facial paralysis electric reaction is either normal or increased. In the severer forms, at the outset of the disease the faradomuscular contractility is often increased, but it then sinks until it is extinguished, while the reaction of the muscle on the affected side to galvanic excitation is greater than on the healthy side. Further on in the disease the galvanomuscular contractility is extinguished. As improvement or recovery ensues the increased galvanic reaction diminishes, while the faradic gradually increases.

Prognosis.—The prognosis is more favorable in children than in adults. It is also more favorable in connection with acute than chronic inflammation in the middle ear. In acute cases the prognosis will be influenced by the general condition of the patient, being more unfavorable in the otitis of tuberculous, syphilitic, and cachectic persons. In chronic otitic cases the prognosis is less favorable than in the acute. A favorable prognostic sign is the return and continuance of the normal reaction of the nerve under the application of the constant electric current. An unfavorable symptom is the extinction of the galvanic reaction and atrophy of the muscles of the face. Loss of the perspiratory function of the paralyzed side of the face indicates atrophy of the nerve. The occurrence of a facial paralysis in the course of chronic purulent otitis media is a grave symptom, as it is frequently a prodrome of a fatal meningitis or brain abscess, and sometimes of sinus disease. Facial paralysis with necrosis of the labyrinth and exfoliation of the cochlea and of portions of the semicircular canals is often evanescent. In exfoliation of the internal porous acousticus, with necrosis of the entire labyrinth, facial paralysis with few exceptions is permanent.

Treatment.—The treatment of facial paralysis must be in accordance with the cause, the duration, and the seat of the lesion. *The application of electricity in acute cases is not indicated until pain, spasms, and all symptoms of reaction have disappeared, because by too early an application of the galvanic current the condition of the nerve may be made worse. When electricity is applied, it should be in the form of a weak constant cur-*

rent through the mastoid fossa of the auricle every other day for 2 or 3 minutes. Facial paralysis occurring in chronic purulent otitis media is most easily overcome by treatment, both medicinal and surgical, of the underlying causative disease in the middle ear. Electricity does less good in chronic than in the acute otitic forms.

Epidemic Cerebrospinal Meningitis with Ambilateral Purulent Otitis Media.—S. Von Stein¹ has reported a case of epidemic cerebrospinal meningitis with ambilateral purulent otitis media in a child of 5 in which both mastoids were trephined and the transverse sinuses were exposed and explored by aspiration. The mastoids were filled with "stringy mucus and pus," but the sinuses were free from pus or thrombus. Recovery in all respects occurred in the course of a month. [The purulent otitis media in this case may be regarded as part of the intercurrent acute bronchitis. We can not agree with the opinion advanced by Von Stein that "possibly in the future the mortality of such cases (cerebrospinal meningitis) which yield to no other treatment may be materially reduced by early opening of the cerebral cavity," nor that "perhaps bilateral opening of the mastoids in typical cerebrospinal meningitis will act as thoroughly as opening of the abdominal cavity in tuberculosis." In our opinion, this child recovered from cerebrospinal meningitis in spite of the mastoid operation, and not in consequence of it.]

Mastoiditis from Use of Nasal Douche.—Death from Leptomeningitis.—Grunert and Zeroni² have reported the case of a woman 57 years old who by using a nasal douche induced acute otitis media and mastoiditis. Chiseling open the mastoid was performed and for 4 days the wound ran a normal course, and entire convalescence seemed near at hand. On the fifth day after the mastoid operation fever, vomiting, and headache with deviation of the left eye (the side opposite to the diseased mastoid) set in, and death occurred on the sixth day after the mastoid operation. The autopsy revealed purulent basilar meningitis, with also purulent infiltration of the dorsal surface of the cerebellum, and pus in the posterior horn of each lateral ventricle. After removal of the dura of the base of the skull there was found on the anterior superior surface of the left petrous pyramid, between the labyrinth and the apex of the petrous bone, a loss of substance, 4 mm. wide, filled with pus and reaching backward as far as the superior petrosal sinus, in which there was a somewhat firmly adherent clot. The labyrinth and carotid canal were free from pus. A grayish-red area in the apex of the pyramid adjoined the deep extradural abscess. It was held that the cause of the fatal purulent leptomeningitis was the deep-seated extradural abscess on the front surface of the petrous pyramid. In the absence of pus in the labyrinth of the ear and carotid canal, we are forced to conclude that the cause of the deep-seated extradural abscess was the intense osteitis of the walls of the middle ear, extending all the way to the pyramid of the petrous bone. We learn from this case, which presented no suspicious symptoms either when admitted to the

¹ Arch. of Otol., Oct. and Dec., 1899.

² Arch. f. Ohrenh., Aug. 3, 1899.

hospital, at the operation, or for some days thereafter, how careful one must be in giving a prognosis even in an apparently harmless case of acute mastoiditis. A deep-seated extradural abscess giving no sign of its existence may suddenly dash all hopes of seeing a patient recover, even after convalescence apparently has set in, as in the case just reported.

Epithelioma of the Middle Ear.—R. C. Myles¹ has observed and reported the occurrence of the rare malady, epithelioma of the middle ear, in a woman of 65. The early history of the aural conditions could not be learned and the probable point of origin could not be ascertained. A mastoid operation revealed a healthy cortex but a cancerous mass extending in all directions from the mastoid cavity. The malignant tissue was found growing upon the dura in the region of the lateral sinus. The morbid growth had also invaded the labyrinth and the facial cavity, and extended below the styloid process and down the muscles and large blood-vessels of the neck. The drum was curetted and the diseased bone of the labyrinth was removed, but the malignant growth in the neck tissues was let alone.

Vibratory Pneumomassage of the External Ear in Chronic Deafness.—Ostmann² employs the electric masseur of Hirschmann, of Berlin, in the application of pneumatic impulses to the membrana tympani in chronic hypertrophic otitis media. The massage is kept up for 10 minutes at a time, and sometimes longer, every day for two weeks, from 1000 to 1200 impulses being applied at a sitting. He concludes that vibratory massage (aerial) is indicated: (1) In chronic deafness consecutive to chronic hypertrophic otitis media; before this treatment of the ear is applied Ostmann urges the necessity of treating all nasal, pharyngeal, and tubal lesions in order to avoid a recurrence of disease in the middle ear; (2) in chronic deafness supervening upon acute catarrhal otitis media defying all other treatment. Vibratory (pneumo) massage is contraindicated: (1) In all acute inflammations of the conducting apparatus of the ear; (2) in all cases in which a lesion exists in the percipient apparatus of the ear, the conduction of sound remaining normal; (3) considering its mode of action, pneumomassage is contraindicated in otitis media that has already induced impaction of the ossicles, or an extensive atrophy of the membrana tympani, or adhesions of this membrane with the promontory. [It would seem from notes of 4 cases given by Ostmann that the hearing is greatly improved by the foregoing mode of treatment, continued daily for from 2 to 4 weeks.]

Chronic Ear Vertigo; Its Mechanism and Surgical Treatment.—C. H. Burnett maintains that chronic ear vertigo (Ménière's symptom) is chronologically the latest symptom or lesion of chronic catarrhal otitis media, being always preceded by profound deafness and tinnitus. It is due to undue impaction of the stapes in the oval window, as well as to stiffening of the round window membrane, from the catarrhal condition of the drum-cavity. In a normal ear any inward pressure of the

¹ Tr. Am. Otol. Soc., July, 1899.

² Ann. d. mal. de l'oreille, Nov., 1899.

stapes upon the labyrinth fluid is compensated by a corresponding outward movement of the membrane of the round window toward the tympanic cavity. Any undue pressure from within the labyrinth by influx of perilymph or endolymph from the cranial cavity is compensated by a corresponding outward movement of the stapes, as well as of the round window membrane, toward the drum-cavity. All or any of these compensations being interfered with, intralabyrinth pressure is increased, the ampullar nerves are unduly compressed, and reflex phenomena are evoked which are termed ear vertigo. As these altered conditions of intralabyrinth pressure are not constant, but vary with the health of the patient and the state of the drum-cavity, chronic ear vertigo is paroxysmal in nature. As retraction of the chain of ossicles, and consequent impaction of the stapes in the oval window, in chronic catarrh of the middle ear play the greatest part in the production of these vertiginous phenomena, Burnett proposes to liberate the stapes from the superposed incus by removal of the latter through an incision in the upper posterior quadrant of the membrana tympani of the etherized patient. This he has done in 27 cases, giving entire relief from vertigo in every instance.

Involvement of the Middle Ear in Mumps.—E. A. Crockett ¹ has observed and reported 2 cases of involvement of the middle ear in mumps in children—one 9, the other 16. The two cases illustrate very well the neglect which ear complications meet at the hands of the general practitioner, as both patients were told the complication was a trifling one, and in the second case the labyrinth symptoms were treated as those of gastritis for nearly 3 weeks. In one case pilocarpin, given daily for 3 weeks, seemed to allay the vertigo.

Excision of Ossicles in Chronic Purulent Otitis Media.—Grunert and Zeroni ² maintain—rightly, we think—that excision of the hammer and incus for the cure of chronic purulent otitis media has been unjustly superseded to a great degree by the so-called radical operation on the antrum and mastoid. Observation of a large number of patients has led them to conclude that excision of diseased ossicles will usually cure the chronic purulency and prevent mastoiditis and its sequels, and they have frequently been called upon to perform mastoid operations that would never have been needed if excision of the ossicles by way of the auditory canal had been performed in time.

W. Schroeder ³ reports the results of 130 extractions of the hammer and anvil in the treatment of chronic purulent otitis media. He shows that this is the only sure means of benefiting suppurations in the attic, so important because so near the brain. This operation should always precede any form of radical operation on the mastoid. The former will generally cure the chronic purulency and prevent mastoid caries. Mastoid radical operations are thus avoided. The results of excision of the malleus and incus in chronic purulent otitis media in public practice among the poor are 50 % of cures; in private practice, 80 %. Caries of the incus was present in 88 % of Schroeder's cases. In 41 % of

¹ Tr. Am. Otol. Soc., July, 1899.

² Arch. f. Ohrenh., Aug. 3, 1899.

³ Arch. f. Ohrenh., April 19, 1900.

these the malleus was normal. The hearing was improved in 65%, unchanged in 22%, and slightly impaired in 13% of these cases. Facial paralysis occurred in 2 instances, but disappeared *without treatment* in 6 weeks.

Attic Suppurations.—E. Mérière,¹ though convinced that the most successful treatment in attic suppurations is excision of diseased ossicles, finds that patients will not always submit to such surgical interferences, not realizing the dangerous nature of their ear disease. In such cases he resorts to energetic cauterization of the attic by means of a saturated solution of chlorid of zinc. In 2 cases, however, he has also achieved good results by means of the insufflation of "iodoformized ipsilène." This drug is a chlorid of ethyl holding iodoform in solution, obtained by a special process.

Primary Inflammation of the Mastoid Process.—T. Heiman,² after reviewing a number of cases of so-called primary inflammation (periostitis, osteitis, etc.) published by both older and more modern writers, and also recording several cases in his own practice that might have been called by other observers primary mastoiditis, but which he considers as entirely secondary products, concludes that "primary mastoid periostitis is without doubt a disease appearing very *rarely* under a distinct clinical form. Primary osteitis of the mastoid exists theoretically, but all those that report its occurrence consider it as an exceptional disease, it being admitted that the cases heretofore described as such a disease rest on errors in diagnosis, and that aurists of authority doubt its existence." So far as concerns Heiman's own observations in a large number of patients, he has been unable to find one single case which he could without hesitation say was one of true primary mastoid osteitis, and he asserts that, from his experience, primary mastoid osteitis does not exist. Cases heretofore diagnosed as such a malady were in reality *secondary to diseases of the external or of the middle ear.*

Discussion of the Indications for Opening the Mastoid in Chronic Suppurative Otitis Media.—This discussion³ took place in VI International Congress of Otology, London, England, Aug. 8-12, 1899, and was participated in by Politzer, of Vienna, W. Macewen, of Glasgow, H. Luc, of Paris, and H. Knapp, of New York. Politzer said that the operative indications were well known, but the great question was to decide whether in the absence of definite symptoms (pain, fever, etc.) it is necessary to operate on the mastoid as often as some authors claim. He classifies the indications in two groups: viz., the objective and the subjective. *Objective symptoms* consist in: (1) Caries of the walls of the tympanic cavity. (2) Granulations and polypi near the aditus, recurring quickly after removal. (3) A fistulous opening in the mastoid cortex, giving rise very often to cholesteatoma (exogenous). (4) Cholesteatoma (endogenous). (5) Hyperostosis of the auditory canal. (6) Facial paralysis or paresis. (7) Painful swelling of the mastoid integument (indication of acute mastoiditis, fistula, chole-

¹ Ann. d. mal. de l'oreille, Dec., 1899. ² Ann. d. mal. de l'oreille, Nov., 1899.

³ Ann. d. mal. de l'oreille, Dec., 1899.

teatoma, or sequestrum). (8) Prolonged fetid suppuration, resisting all treatment, especially if the upper posterior region of the membrana is perforated, and if the remnants of the membrana are adherent to the internal wall of the drum-cavity; and still more so if pus or epithelial masses can be drawn from the region of the aditus by means of aspiration with Siegle's pneumatic ear-speculum. (9) Symptoms of tuberculosis supervening in a case of chronic purulent otitis media. (Aural suppuration in an individual affected with pulmonary tuberculosis is a contraindication for surgical interference in the mastoid.) Finally, elevation of temperature preceded by chills is a symptom of phlebitis of the sinuses or of direct septic absorption. There may be added to this list, attacks of vomiting, headache with symptoms of cerebral lesions, or changes in the eye-ground. *Subjective symptoms* are: (1) Persistence of pain in the ear or in the mastoid, and especially in the parietal or occipital regions, increasing on percussion and indicating the possible presence of an abscess in the temporal lobe or in the cerebellum. (2) Permanent or intermittent vertigo, due to erosion of the external (horizontal) semicircular canal or to an extension of the affection to the interior of the labyrinth (as indicated by the same tuning-fork tests as are employed in nervous deafness, and necessitating ablation of the labyrinth, as recommended by Jansen). (3) Marked cerebral disturbances, as headache, torpor, loss of consciousness, etc.

The mastoid operation is specially indicated when the *objective* symptoms are accompanied by grave *subjective* symptoms, and the cerebral complications, instead of being contraindications, necessitate an *immediate intervention*. Symptoms of serous meningitis disappear often as soon as the ear disease is relieved, but not so in suppurative meningitis. However, these lesions do not contraindicate surgical intervention so long as lumbar puncture fails to demonstrate the presence of infection in the cerebrospinal liquid. Very often the clinical symptoms do not agree with the pathologic changes discovered in the course of the operation. Sometimes only a little granulating tissue is found in the attic or antrum after an operation undertaken for the relief of lesions suspected to be very grave. On the other hand, important lesions are discovered in cases in which nothing serious was ever suspected before the operation. It is difficult to state positively the operative indications in any and every case, and the time for surgical intervention, therefore, should be left to the surgeon in charge in every instance. Many cases of chronic suppurative otitis media are cured by energetic antiseptic treatment, the extraction of granulations or of cholesteatomata from the drum-cavity and the attic, and the partial ablation of the outer wall of the attic. Though a friend to the "radical operation" on the mastoid in suitable cases, Politzer does not advise recourse to it *simply to check stubborn purulent otorrhea, as certain surgeons do*. In such cases he deems it *useless* to resort to an operation which, though harmless when performed by a skilful operator, is always serious by reason of the possibility of injury to neighboring parts, of its possibly resulting in total loss of hearing in patients who heard well before the operation, and also because this

operation requires so long a time for healing that often the patient is put *hors de combat* for several months. [And he might have added that its results as a curative of chronic otorrhea are no better than, if as good as, those effected by removal of diseased ossicles and the thereby improved drainage of the middle-ear cavities and the consequently more efficiently applied antiseptics.]

Luc maintained that "opening of the mastoid is indicated in the course of chronic otorrhea under three distinct circumstances: (1) When the object is to give vent to pus in cases of purulent retention; (2) for the circumvention of conditions indicating the threatening or the commencing of intracranial infection of aural origin; (3) for the cure of otorrhea after it has been recognized that this has proved intractable to different methods of local treatment applied through the auditory meatus, including the extraction of the ossicles and the curetting of granulations accessible through this passage. The operation is urgent only in the first two cases. In all cases of chronic otorrhea the opening in the bone should extend from the antrum to the attic, or from the attic to the antrum, and be followed by curetting and complete disinfection of the whole of the cavities of the middle ear. In the case of threatening intracranial complications the osseous breach ought to extend from the first to the suspected region of the dura mater; this membrane, however, is not to be opened until a second operation after a delay of armed expectation of as short duration as possible, if the threatening signs in question are seen to persist, or, still more, "to increase." Conservative views like those of Politzer and Luc were expressed by Lucae, Guye, Noyes, McBride, Gradenigo, Moure, Eeman, Barr, Faraci, T. M. Hovell, and Cresswell Baber.

William Macewen¹ opened his remarks by giving the one broad general indication for operation on the mastoid: viz., "When a pyogenic lesion exists in the middle ear, or in its adnexa, which is either not accessible or which can not be effectually eradicated through the external ear, the mastoid antrum and cells ought to be opened." Similar views were expressed by H. Knapp, Jansen, and W. Milligan.

Radical Mastoid Operation.—Tympanomastoid Exenteration.—J. Orne Green² has performed the "radical operation or the tympanomastoid exenteration" in 25 cases of uncomplicated chronic suppuration of the middle ear. He believed it "to be not only a most valuable operation for the cure of chronic suppurations deeply seated in the temporal bone, but also one of the most complicated operations in surgery, for its success depends upon attention to the minutest details, not only throughout the operation itself, but in the entire after-treatment." In Green's cases success in curing the chronic otorrhea and getting complete epidermization was attained *in all but one*. The one great danger in the operation is the injury of the facial nerve. According to Green, the four great technical difficulties in this operation are: (1) thorough cleansing of the cavity of the exenteration; (2) getting the exposed bone surface covered; (3) keeping down exuberant granulation

¹ Jour. of Laryn., Rhin., and Otol., Aug., 1899. ² Tr. Am. Otol. Soc., July, 1899.

tissue; and (4) producing epidermization of the new-formed cavity, with permanent retro-auricular opening. B. A. Randall¹ advocates the so-called radical operation upon the middle-ear cavities (exenteration), *without a permanent opening* behind the auricle, however, as the only sure means of curing chronic suppuration of the middle ear. The mastoid cells are not to be included in this operation unless demonstrably affected. He succeeds in effecting epidermatization of the large, new-formed common cavity without even a temporary retro-auricular opening. The mastoid wound is healed by first intention, silver wire sutures being used.

In the formation of the skin-flaps for lining the new-formed cavity Randall, by an original plan, splits the canal flaps into two layers, a skin-flap and a periosteal one, all cartilage being dissected away, thus getting twice as large a flap and a more pliable one for coapting over the bared bone surfaces. The flaps are to be arranged in place by gauze pledgets inserted through the meatus, but fastened originally into position through the wound behind the auricle. The latter is then closed and healing by first intention sought. Subsequent dressings must be effected through the auditory meatus.

Blood-clot in Mastoid Operations.—C. J. Blake² demonstrates afresh the value of the blood-clot in mastoid operations as a substitute for the usual method of packing and healing by granulations, both in acute and chronic cases, "it being, of course, understood that the most complete possible removal of all diseased tissue is an important preliminary to success." In some cases mere apposition of the edge of the wound under firm pressure without stitches is sufficient to induce healing by first intention.

E. B. Dench³ advocates the Stacke-Schwartz operation for the cure of chronic otorrhea, *i. e.*, throwing the middle ear, external canal, and mastoid cells into one cavity, and then lining them with cutaneous tissue. The retro-auricular opening is to close by first intention. Of course, this operation he does not advise until excision of the ossicles and curetment of the diseased tympanum have been performed through the auditory canal, but have proved insufficient in curing the otorrhea and thus warding off intracranial lesions.

P. Manasse and A. Wintermantel⁴ have reported 77 radical operations. They are careful to state that they are slow to have recourse to this operation, in the absence of any vital indications, simply for the cure of chronic purulent otorrhea. They have operated most frequently by a Zaufal-Jansen method, the Stacke method being employed only when the sinus lies abnormally far forward. The retro-auricular wound closed by first intention in 29 cases, by secondary union in 18 cases, and in 20 cases there remained a permanent retro-auricular opening.

Radical Operation on the Mastoid; After-treatment.—Grunert and Zeroni,⁵ representing the usage of the Halle clinic for diseases of the ear, state that their rule at present is "to permit the retro-auricular

¹ Tr. Am. Otol. Soc., July, 1899.

² Tr. Am. Otol. Soc., July, 1899.

³ Tr. Am. Otol. Soc., July, 1899.

⁴ Arch. of Otol., Aug., 1899.

⁵ Arch. f. Ohrenh., Aug., 1899.

wound to remain open at first." Only exceptionally do they permit union by first intention. In many cases in which this has been effected they have had reason to regret it. This is especially so when furuncles or perichondritis have set in and, by narrowing the auditory canal, have interfered with inspection of the middle ear, and also with the introduction of the dilating ear-speculum used by these operators for making a permanently wide canal. This permanently wide meatus and canal render it possible to do away with a permanent opening behind the ear. The widening is accomplished by lengthening outward the incision which splits longitudinally the cartilage of the external canal until it extends well into the concha. This incision into the fossa of the concha is allowed to granulate slightly, and then by daily dilation of the thus enlarged meatus by tampons and the introduction of a very wide ear-speculum there is obtained an enlarged, completely round auditory meatus, but one by no means noticeable. The ear-speculums used for this dilation in the after-treatment differ from the usual form in being nearly cylindric and of a diameter of about 10 mm. These are introduced daily when the dressings are changed for purposes of examination and tamponing, and are increased in size until the surgeon is satisfied with the width of the new meatus. It has been found by Grunert and Zeroni that the cartilaginous cicatrix is extraordinarily extensible and easily permits the formation of a widened meatus and canal. A subsequent contraction in the healed meatus thus formed they have never observed. Through this wide opening in the canal, with the aid of the aforesaid ear-speculums, the entire field of operation on the middle-ear spaces can be inspected. At the same time that this is being accomplished in the auditory meatus and canal, the retro-auricular wound is left partly open at first. By this means when the opening in front is not yet wide enough to inspect deeper and posterior portions of the field, such portions can be inspected from the retro-auricular opening, and the surgeon can thus see whether the tampons can be properly introduced through the external auditory canal. As the ability to inspect through the widened canal increases, the opening behind the auricle can be allowed to contract, until finally it serves only as a means of inspecting those portions of the field not visible from in front through the auditory meatus. As soon as inspection through the external auditory meatus is satisfactory, the retro-auricular opening is permitted to close completely. If this provisional opening behind the ear is tamponed daily with care, and epidermization of its edges prevented, the opening can be maintained at any size desired for any length of time, and at any moment a closure of it can be effected by omission of the tampons. Hence the primary closure of the retro-auricular opening is rarely employed by the surgeons in the Halle ear clinic, the provisional opening being employed, as it favors inspection and treatment of the middle-ear cavities while they require it, and can be closed as soon as it is no longer needed for these purposes.

Trautmann's Operation for Closure of the Persistent Retro-

auricular Opening after Radical Operation on the Middle-ear Cavities.—Trautmann¹ employs chloroform as the anesthetic. After careful cleansing and sterilization of the new-formed middle-ear cavity, a gauze tampon is introduced into the osseous ear-cavity to prevent the entrance of blood. In the middle of the upper and lower edges an incision is made, 4 mm. long, extending 2 mm. into the wound-cavity in the direction of its long axis (Fig. 90); then in the posterior and anterior periphery an incision is made, beginning at the aforesaid upper

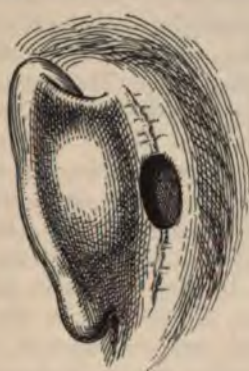


Fig. 90.



Fig. 91.



Fig. 92.

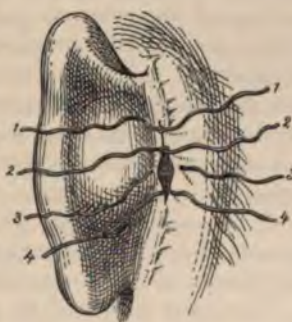


Fig. 93.



Fig. 94.

Figs. 90-94.—Trautmann's operation for closure of the persistent retro-auricular opening after radical operation on the middle-ear cavities (*Arch. f. Ohrenh.*, Dec. 27, 1899).

longitudinal incision and ending in the lower longitudinal incision. (Fig. 91.) These last-named incisions in the middle of their course should be 4 mm. from the edge of the retro-auricular opening. They are also made to extend to the periosteum behind and to the perichondrium in front. The posterior flap is drawn forward toward the wound-cavity with a raspator; the anterior flap is dissected up by means of a knife. The soft parts on the mastoid must also be loosened, so that the skin can be brought into the final suturing. Then the anterior and posterior flaps

¹ *Arch. f. Ohrenh.*, Dec. 27, 1899.

are turned into the opening and isolated, and into the anterior and posterior flaps a needle is inserted twice in the longitudinal axis, so that the four ligatures are placed in the anterior and posterior flaps. (Fig. 92.) 1 and 2 represent the first ligature; 3 and 4, the second ligature. In this direction a suture is easily run by a slightly curved needle, while in a horizontal direction, from side to side, a suture is placed only by means of very sharply curved needles at some inconvenience. When the sutures are introduced as previously stated, ligatures No. 2 are held by an assistant, and the ligatures No. 1 are tied. Then ligatures No. 2 are tied. Then ligatures No. 4 are held and No. 3 tied, and finally No. 4 is tied. These ligatures are of catgut. The skin over this wound surface is finally sutured with silk. (Fig. 93.) The gauze that was placed in the cavity is removed and renewed through the external auditory meatus. An aseptic bandage is then placed over the wound and allowed to remain in place for 5 days. When the dressing is changed, the gauze in the auditory canal is usually damp with bloody serum. The skin always heals by first intention. The next dressing is allowed to remain on 2 days. In from 1 to 2 weeks the gauze in the auditory canal will be found to be dry and the closure permanently cicatrized. By the retraction of the auricle the entrance to the auditory canal is somewhat widened, and inspection of the fundus of the canal is made easy. The scar behind the ear is smooth. (Fig. 94.)

Bacteriologic Cultures in Otitic Brain Abscess.—Ernst Leutert,¹ after many long-continued observations and bacteriologic cultures, concluded that in otitic brain abscesses the streptococcus is the chief causative factor. The staphylococcus has less influence, the other bacteria possess merely a subordinate place, and the pneumococci do not occur at all, as nearly all brain abscesses form only in connection with chronic suppurations. A second statement made by Leutert is that the bacteria of a brain abscess are reduced in their vitality, and hence in their virulence. This holds good not only for the pyogenic, but also for the septic bacteria. *Bacterium coli* and *Proteus vulgaris*, found sometimes in pure culture from a brain abscess, are not to be considered the original excitants of the abscess. The latter is caused by pyogenous cocci, which, because of the reduction in their vitality, fail to grow in the culture-medium, while other cocci, like the foregoing, succeed in growing. This reduction in vitality of the pyogenic cocci under consideration may form the chief reason for the occurrence of a cerebral abscess. Körner has shown that otitic brain abscesses, with few exceptions, are found near the diseased parts of the temporal bone, and in most cases the passageway from the diseased bone to the brain abscess can be traced. Therefore the inflammation extends by continuity from the bone to the brain-substance. It can not be urged against this theory that sometimes the brain-substance between the diseased bone and the abscess is apparently healthy, for these parts of the brain may heal if the disease in the petrous bone is lessened by better surgical drainage, while the abscess in

¹ Arch. f. Ohrenh., July and Sept., 1899.

the brain beyond continues unaltered. Again, this theory is not weakened by the fact that sometimes the abscess does not lie over the diseased bone, because the inflammation passing from the bone to the dura can wander a distance in the latter before it reaches the inner dural surface. Finally, at this point adhesion with the pia occurs, and a circumscribed meningitis is set up, by which the adjacent brain tissue is attacked. It is held to be unlikely, and it certainly has never been shown, that bacteria productive of an otitic brain abscess reach the brain tissue by way of the lymphatics, from distant centers of infection. So far as the blood channel is concerned, either a brain abscess must originate directly by conveyance of the inflammation from a suppurating thrombus in a blood-vessel, or the infective organisms must reach their place of development as arterial embolisms after passage through the entire circulation.

Leutert maintains that it is the reduction in the virulence of the specific micro-organisms that effects the occurrence of a **circumscribed meningitis**, the preliminary condition of nearly all brain abscesses, whereas virulent bacteria, if they ever reach the inner surface of the dura spread so rapidly over the leptomeninges that a diffuse meningitis is the speedy result. Hence a brain abscess is rarely found in connection with acute mastoid affections, though the latter affections are caused by more virulent bacteria. In such cases the meningitis is the direct result of the epidural suppuration. If, however, the virulence of the bacteria is nearly exhausted, an affection of the brain-substance from the circumscribed meningitis rarely occurs, and the latter can exist independently for a long time. "Therefore in doubtful cases, presenting symptoms of brain pressure in connection with acute suppuration, and after exclusion of a superficial epidural abscess, one must suspect the existence of a deep-seated epidural abscess rather than a brain abscess." Leutert claims to have been the first to report the occurrence of *Bacterium coli* in a brain abscess. In several cases, notwithstanding the absence of septic bacteria, the pus was extremely fetid.

Brain Tumor Complicating Suppuration of the Middle Ear.—

Hessler¹ adds another case of tumor of the brain—large-celled sarcoma of the temporal lobe—complicating a case of acute scarlatinous otitis media in a girl of 11. Symptoms of mastoid empyema set in, and the mastoid was opened and pus evacuated. Temporary improvement in all symptoms occurred, but on the eighteenth day after the mastoid operation convulsions and paretic symptoms pointed to implication of the left middle lobe of the brain on the side of the affected ear. Without making any diagnosis as to the probable nature of the lesion in the left middle lobe of the brain, the squama was trephined, the dura was found distended, but not pulsating, and an incision into it was followed by escape of arterial and venous blood, the latter dark and serous. The brain seemed distended and showed venous hyperemia. Six punctures in various directions into the brain were negative in their result. The patient seemed better the next day and the wound in the squama seemed

¹ Arch. f. Ohrenh., Dec. 27, 1899.

to be healing. Everything went well for 13 days, when suddenly in the night the patient woke up with a scream, complained of severe pain in the left ear, and passed quickly into coma, which continued until her death, 4 days later. On the morning following the sudden attack of pain in the night the brain-cavity was again opened without narcosis and the brain was found prolapsed and necrotic 3 mm. deep. While mopping this necrotic region the brain surface suddenly ruptured, and continued to discharge a clear, serous fluid in a thin jet until about a fluid-ounce had escaped. Through the sinus thus formed the finger could be passed into a cavity in the brain the size of an apple, the walls of which were soft, especially behind. The coma continued, the urine escaped involuntarily, the temperature rose to 105.6° F., the pulse ranged between 120 and 160, stertorous breathing set in, and death occurred 4 days later. The morbid growth, occupying nearly the entire left temporal lobe, proved to be a large-celled sarcoma. In forming a diagnosis of the brain disease in connection with a purulent otitis media, Hessler points out the important fact that "the more prominent the ear symptoms remain in the case, and the more rapidly the symptoms of cerebral irritation give place to those of cerebral paralysis, the more certainly can a diagnosis of the existence of an intracranial complication, like abscess, directly dependent upon ear disease be established. The more the symptoms of ear suppuration remain limited to the cavities of the petrous bone, and the more the characteristic grouping of the individual symptoms of an intracranial complication and its course indicate the existence of a brain lesion not directly dependent on ear disease, the more certain is the diagnosis of a brain tumor. A true estimate of the symptoms and their localization is rendered difficult by the fact that the ear suppuration is sometimes on the side of the brain tumor and sometimes on the opposite side.

E. Leutert¹ shows that further experience substantiates his previous claims that "if the temperature continues for several days above 102.3° F. (39° C.) in a case of middle-ear inflammation, it must be considered as a sign of the existence of otitic meningitis or of a sinus thrombosis." This is not an invariable rule, as occasionally a continuously high temperature for a week (39.7° C., about 103° F.) may be due entirely to the tympanic inflammation. Again, such a case might mask a perisinuous suppuration in a sinus thrombosis that had rapidly developed. In such an instance if there are no local symptoms in the mastoid nor in the external auditory canal indicative of mastoid empyema, the surgeon might be obliged to open the mastoid, and perhaps the sinus, for purely diagnostic reasons. If after this interference it should be found that the operation was not needed, and that the fever was due to tympanic disease alone, no harm can come from the surgical exploration, and by acting in the same way in other cases the operator *will not be too late when the operation is really demanded by reason of the disease in the mastoid and sinus*. It must be borne in mind in this connection that furuncles in the auditory canal and periauricular abscesses may give rise to a body-

¹ Arch. f. Ohrenh., July and Sept., 1899.

temperature of even 40° C. (104° F.); but in such cases the disease in the external ear and absorption by the lymphatics in the neighborhood are so plainly the cause of the fever that no observant diagnostician could refer the high temperature to any other cause.

Otitic pyemia is held to be due, not to an osteophlebitis, but to sinus thrombosis. If in a case of mastoid empyema and epidural abscess the temperature suddenly becomes high, having been normal perhaps before, it will thus become evident that the epidural abscess lies over the sinus, the wall of which has allowed the passage of toxins and micro-organisms into the circulation. Elevation of temperature does not always occur as soon as the inflammation or suppuration reaches the sinus, because the strong outer wall of the sinus resists the encroachment of inflammation upon its inner surface and the consequent passage of toxins and micro-organisms into the circulation. In some cases, however, the virulence of the micro-organisms is so great that the outer sinus wall is destroyed rapidly by the inflammation in the mastoid, and comparatively quickly a sinus thrombosis is found in close chronologic connection with an acute disease in the middle ear. Leutert calls attention to the fact that typical chills may occur at short intervals in cases of perisinous suppuration without any thrombosis of the sinus.

Otitic brain abscess is sometimes attended with high fever at the beginning. This may be due to the attendant sinus thrombosis or meningitis. In other instances Leutert thinks that the high fever may be due to the extension of inflammation from the temporal bone and the drum to the pia mater, so that sometimes there exists in the early stage of a brain abscess a circumscribed leptomeningitis that causes a continued elevation of temperature until the affected parts of the pia are entirely shut off from the normal portion by adhesions. The leptomeningitis in such cases may be only a serous meningitis, never reaching a purulent stage, and rapidly passes away. Leutert thinks that this will explain the fact that lumbar puncture has shown a turbid cerebrospinal fluid containing numerous white blood-cells in cases in which the postmortem has revealed no meningitis, as in such instances the lumbar puncture happened to be made during the existence of an evanescent serous leptomeningitis. He also states that most of the cases of brain abscess that have recovered after operation showed little or no elevation of temperature before operation, while those that have proved fatal showed high temperature, indicative of infection of the meninges, before operation was performed. He concludes, therefore, that in the rare instances in which on account of high fever the diagnosis vibrates between sinus thrombosis and brain abscess, lumbar puncture enables us to decide upon the diagnosis. Furthermore, if only slight changes in the cerebrospinal fluid are found by lumbar puncture, the prognosis is not absolutely hopeless, and an operation, which may even then save life, must not be omitted.

Pneumococcic Empyema of the Mastoid.—Leutert calls attention to the "surprising fact" that in pneumococcic mastoid empyemas and epidural abscesses otorrhea had ceased, as a rule, at the time of the manifestation of the lesion of the mastoid and the dura. The surgeon, there-

fore, must not cease to observe, or at least must not dismiss as positively cured, a patient who has had an aural suppuration of short duration (if it has been pneumococcic), even after complete restoration of hearing, since weeks later an empyema or an epidural abscess may develop from a latent focus of infection in the ear. Furthermore, we are justified in a case of pneumococcic suppuration sooner than in other forms in suspecting the occurrence of an epidural abscess, and at the operation we should endeavor to discover narrow fistulae, and, if found, follow them to their termination. In cases in which the condition of the membrana tympani renders it undecided whether the suppuration is subacute or chronic, the detection of pneumococci renders it certain that the suppuration is not a chronic one. Furthermore, it is highly probable that a part, if not all, of those cases reported as primary osteophlebitic mastoid diseases, because when first seen by the surgeon they were free from aural suppuration or any trace of it, were in reality empyemas of pneumococcic origin, but without any of the primary disease remaining in the drum-cavity. Even the statement of the patient that there has never been a discharge from the ear, and also a nearly normal hearing, will not justify the diagnosis of a *primary mastoiditis*. In fact, the occurrence of such a form of mastoid disease is becoming more and more doubtful, for it can usually be shown upon careful, unprejudiced investigation that it is *secondary* to some other disease in some part of the auditory apparatus. Leutert also shows that tuberculous middle-ear diseases are not so frequent as was once supposed. He reports 2 cases of suppurative otitis media in children of 6 months and 7 months respectively in which a normal ear was infected from the diseased ear by syringing septic matter from a diseased ear through the Eustachian tube across the nasopharynx into the well ear. Great caution should therefore be observed in syringing diseased ears in young children. A series of 95 cases is presented by Leutert on which the foregoing conclusions are based.

Sinus Thrombosis.—*Symptoms.*—G. Bacon,¹ in an article on sinus thrombosis in acute otitis media, states that "if the mastoid cells have been thoroughly removed, with all diseased tissue, and the patient suddenly has a chill (in some cases so slight that it is likely to be overlooked), followed by a rise of temperature to from 104° to 106° F., and other complications can be excluded, the diagnosis can almost certainly be made of sinus thrombosis, especially if there is tenderness along the neck over the internal jugular vein and there is a more or less edematous condition of the tissues below and behind the mastoid tip, and extending over the point in the skull where the mastoid vein enters." Febrifuges are to be avoided in these cases, as they mask the symptoms and lead to deferring the operation for relief of the sinus thrombosis, the early diagnosis of which is most important, but can not be made in the absence of high fever. If the fever is masked by drugs, the disease is not recognized promptly, and an operation is either not performed at all or performed too late to save life.

¹ N. Y. Med. Jour., July 1, 1899.

Otitic Leptomeningitis: Diagnosis and Curability.—G. Gradenigo¹ has reported 4 cases of otitic leptomeningitis, 3 of which followed chronic purulent otitis media, and 1, acute otitis media. One of those following chronic purulency of the ear died; the other 3 recovered after operation. In two of the cases—one of acute, the other of chronic, purulent otitis media—lumbar puncture aided the positive diagnosis of purulent leptomeningitis. The case that proved fatal was one of bilateral chronic suppurative otitis media, with extradural perisinous abscess on the right side, with incipient thrombosis of the sigmoid sinus and basilar leptomeningitis. The patient was a girl of 14. She came under treatment for chronic otorrhea and deafness, presenting no intracranial symptoms, and underwent a radical Stacke-Zaufal operation on the left antrum and middle ear, because on this side there were more local changes visible in the ear. Death in coma occurred in 6 days. The autopsy revealed, as previously stated, that the intracranial lesion was limited to the right, the unoperated side, thus showing that death was in no way connected with the operation on the left ear. Death was due to a *latent* chronic intracranial lesion of otitic origin on the right side. The operation for the relief of the two chronic cases consisted in a combination of the radical exposure of the middle-ear cavities and craniotomy along the pathway of disease from the ear to the cranial cavity. In the case of leptomeningitis occurring in the course of an acute otitis media, the diagnosis of leptomeningitis being made by lumbar puncture (Quincke's method), the operation in the ear was limited to opening the antrum, with negative result, and then an incision of the membrana tympani, followed by a copious flow of pus.

Meningitis with Low Temperature.—F. Allport² has reported a case of influenza followed by mastoiditis, sinus thrombosis, meningitis, and death in a man of 76. This man appeared to be recovering rapidly when he suddenly developed meningitis. A remarkable feature in the symptoms was a subnormal temperature instead of a high one such as is usually associated with acute meningitis. The autopsy revealed no cerebral abscess.

¹ Arch. f. Ohrenh., Nov. 20, 1899.

² Arch. of Otol., Oct. and Dec., 1899.

DISEASES OF THE NOSE AND LARYNX.

By E. FLETCHER INGALS, M.D., AND HENRY G. OHLS, M.D.,
OF CHICAGO. OF ODELL, ILLINOIS.

Conservatism in Nasal Surgery.—Clarence C. Rice¹ attributes to the rapid invention of nasal apparatus and instruments a few years ago the alleged excessive surgical activity that followed. Recently the best practitioners have considered the pathology and etiology of nasal disease, and have differentiated more carefully purely local from constitutional and diathetic conditions. The field of nasal surgery has thus, in a sense, been restricted, but brilliant results have attended conservatism as to surgery combined with constitutional treatment when indicated.

The Nose and Throat in Life-expectancy.—E. Fletcher Ingals² believes that life-insurance examinations should include examination of the nose and throat in subjects whose heredity or personal history or appearance or a quick pulse leads the examiner to suspect the beginning of pulmonary or cardiac disease. In a certain small percentage evidence will thus be secured of diseases that greatly shorten the expectancy.

Suprarenal Extract.—W. H. Bates³ advises the use of freshly prepared aqueous solutions of suprarenal extract in diseases of the mucous membranes, as in 6 years' extensive use of the remedy he had found no antiseptic that would preserve the solution satisfactorily, mentioning boric acid especially in this connection. Camphor he found objectionable, as it disguises the odor of the extract and prevents the detection of beginning decomposition. Such a solution instilled into the eye would cause an acute iritis. J. Clarence Sharp⁴ also prefers a fresh 10% aqueous solution. [Extensive use of the solution mentioned last year under "hay-fever" has demonstrated that it remains stable for from 6 to 12 weeks. We have recently added to the foregoing $\frac{1}{2}$ % of **chloretone**, which, it is believed, increases its stability without rendering it irritating.]

Secondary Hemorrhage and Suprarenal Extract.—F. E. Hopkins⁵ noticed the increased tendency to secondary hemorrhage from 2 to 6 hours after operations with the use of suprarenal extract. He also observed the occasional severe coryza following its use in some patients. To localize the action of this remedy Jonathan Wright⁶ smeared the powdered extract with a moistened probe over the field of operation.

¹ Med. News, April 28, 1900.

² Laryngoscope, Feb., 1900.

³ Laryngoscope, April, 1900.

⁴ Phila. Med. Jour., May 12, 1900.

⁵ N. Y. Med. Jour., Aug. 12, 1899.

⁶ Laryngoscope, April, 1900.

Emil Mayer¹ thought the danger of secondary hemorrhage made the use of suprarenal extract inadmissible for operations on the tonsils and on adenoids.

Protargol in Rhinolaryngology.—Alexander² recommends the use of a 1 % solution of protargol in water, to be kept in dark bottles. In follicular tonsillitis it is inert; nor does it prevent the formation of peritonsillar abscess. It is also useless in pharyngomycosis, in diphtheria, and in aphthous and syphilitic ulcerations. He has used it in strength up to 50 % as applied to tuberculous ulcers of the tongue without success. On the contrary, it has been found useful in chronic catarrh of the upper respiratory passages, though patience is necessary. It is particularly well adapted for use in the chronic catarrhal laryngitis of singers, as it does not irritate in mild solutions and the patient can sing soon after the application. It is also suitable for cases of simple inflammation of the sinuses without secondary changes. [We have found it advantageous for checking prolonged suppurations of the antrum and frontal sinus in solutions varying from 5 % to 20 %. The former is as strong as can safely be intrusted to the patient for continued use.]

Nasal Deformities.—Felix Semon³ attributed the hypertrophy of the nose in certain obscure cases to traumatism, the acute symptoms quickly subsiding but chronic insidious periostitis or perichondritis continuing. He advised iced-water applications and potassium iodid internally. Dundas Grant⁴ thought that vascular pressure, as from an enlarged middle turbinate, might cause the enlargement, and that removal of the turbinates would reduce the external enlargement materially. Fitzgerald Powell⁵ thought that tubercle or syphilis would generally be found at the base of the trouble, traumatism being only the exciting cause, as is frequently the case in osteitis.

J. L. Goodale,⁶ to correct the deformity of an **exaggerated Roman nose**, with the patient etherized and in Rose's position, introduced curved scissors into the left vestibule with the convexity upward. Penetrating the triangular cartilage at its anterior extremity, just beneath the integument, a cut was made along the superior margin of both the cartilaginous and bony septum to the junction of the perpendicular plate of the ethmoid with the cribriform plate. The extremities of the incision were then connected by a straight cut and the intervening section of the septum was removed with forceps. To depress the bony bridge the articulation of the nasal and maxillary bones was sawed through from below upward on each side and the frontal articulation broken by gentle taps. This left the profile of the nose straight, but the maxillary bones then formed a ridge along the lines of the nasal articulation. This was corrected by fracturing the maxillary bones by light blows with a protected mallet. An external splint was applied. John O. Roe⁷ described and figured some brilliant results in the **subcutaneous correc-**

¹ Laryngoscope, April, 1900.

² Gaz. hebdom. de méd. et de chir., July 16, 1899.

³ Jour. of Laryn., Rhin., and Otol., Jan., 1900.

⁴ Jour. of Laryn., Rhin., and Otol., Jan., 1900.

⁵ Jour. of Laryn., Rhin., and Otol., Jan., 1900.

⁶ Boston M. and S. Jour., Feb. 2, 1899.

⁷ Am. Med. Quarterly, June, 1899.

tion of deformities. He attributes his success to (1) the greatest antiseptic and aseptic precautions; (2) careful study of the plan of operation, so as to utilize the tissue at his disposal to the best advantage; (3) minute supervision of the healing process, with frequent change of dressings and appliances; (4) minor secondary operations as often as essential to the best results. (See Figs. 95-98.)

J. Homer Coulter¹ treated a case of **severe deformity of the nose**, due to the kick of a horse 12 years before, in which there was absence of the plate of the ethmoid and of the cartilaginous septum with exostoses



Fig. 95.



Fig. 96.



Fig. 97.



Fig. 98.

Figs. 95-98.—Showing deformities and the results of subcutaneous correction (John O. Roe, in *Am. Med. Quarterly*, June, 1899).

over the frontonasal articulation. The deformity was pug-nose with small nasal cavities. With a long narrow chisel and an Adams forceps, Coulter broke up the masses of bone, operating within the nares. The pieces were then forced into the median line, and held by a splint with malleable blades applied on the outside. (Fig. 99.) The small spring wire, modeled after Roe's suggestion, was introduced into each naris to hold up the dorsum, reinforced by snugly fitting Mayer tubes. The pug effect was overcome by excising a V-shaped piece from the columnar car-

¹ *Medicine*, June, 1900.

tilage and skin. The septum was later stiffened by a plastic operation, using a piece of prominent cartilage from the base. The springs were



Fig. 99.—Splint for correction of nasal deformity (Coulter, in *Medicine*, June, 1900).

worn for 10 days, the other splints for 4 weeks longer, being replaced at intervals.

Henpuye.—Albert J. Chambers¹ describes a curious form of usually symmetric exostoses of the external surface of the nasal bones, the nasal process of the superior maxilla, and the body of the latter in advanced cases. It never encroaches upon the orbit, nasal cavities, or mouth, but may interfere with vision by growing up in front of the eyes. The disease is found among the natives of the Gold and Ivory Coasts of West Africa, and also in the West Indies. The writer thinks that it is due to an osteoplastic



Fig. 100.—Nasal septometer (Pyncheon, in *Laryngoscope*, Dec., 1899).

¹ *Lancet*, Jan. 6, 1900.

periostitis caused by the absorption of the poison of "yaws" from the nasal mucous membrane. The earliest symptom is pain in the nose, with the presence of a nasal lesion; later, headache is sometimes felt and pain in the swelling during wet weather. The growth develops slowly for years, but may cease before the tumor is large.

Edwin Pynchon¹ devised an ingenious automatic **nasal septometer**, which indicates the thickness of the septum as it moves about from point to point. (Fig. 100.)

Epistaxis from Ethmoidal Disease.—A. Brown Kelly² described 4 cases of severe and repeated hemorrhage from the upper part of the nasal cavity above the middle turbinate. A narrow strip of gauze inserted between the middle turbinate and the septum controlled the bleeding, and after the second or third daily packing the bleeding ceased. It is not necessary to pack the lower or respiratory portion of the nose. From the anatomic relations, it seems probable that the bleeding was from the anterior ethmoidal veins, which anastomose with the veins of the dura mater and with the superior longitudinal sinus.

Cerebrospinal Rhinorrhea.—W. Freudenthal³ observed a rare case of discharge of cerebrospinal fluid from the naris of a woman 50 years of age. In 1897 she had severe pain in the frontal region for 9 weeks, with impairment of the faculties, including hearing. With the beginning of the discharge there was relief from pain and much mental improvement, but the sense of smell was lost. An intercurrent fever was attended with decreased discharge and return of the mental symptoms. With that exception the discharge was free, running in a stream when she lay on her side. Chemical examination of 120 cc., collected at intervals during 24 hours, showed a clear fluid; no sediment; sp. gr., 1.0072; total solid, 1.3%; mineral salts, 0.39%; no mucin; glucose, 0.05%. The writer's theory is that the woman had a tumor of the hypophysis cerebri, and that the escape of fluid through the cribriform plate by relieving the pressure averted more serious mental disturbance. Regarding the treatment of such discharges he states that checking them is impossible and inadmissible as well. St. Clair Thomson⁴ attributes this condition to escape of the subarachnoid fluid through the perineural sheaths of the branches of the olfactory nerves. In the case the writer personally investigated there was no impairment of smell. He collected from the literature 8 cases similar to his own and 12 more that were probably of the same character.

Rhinedema.—H. Holbrook Curtis⁵ notes the occurrence of edema of the nasal mucous membrane chiefly in neurotic women and in men of sedentary habit between the ages of 30 and 50 years, and sometimes in youths of from 15 to 19. This condition is independent of the seasons and of external irritants, often of the sympathetic system, and is associated with local hypertrophies and new growths, such as polyps. The tissues are spongy and pale, with a bluish tinge. Cocain does not

¹ Laryngoscope, Dec., 1900.

² Lancet, Feb. 24, 1900.

³ N. Y. Med. Jour., Mar. 31, 1900.

⁴ Brit. Med. Jour., Sept. 23, 1889.

⁵ N. Y. Med. Jour., Dec. 16, 1899.

contract the membrane, which in some cases breaks down in ulcers; in others, is covered with mucopurulent secretion. As to treatment, gymnastic exercise daily to cause free perspiration, or open-air exercise followed by a cold bath and an alcohol sponge, is essential. Flushing the colon night and morning with 4 quarts of water containing a spoonful of sea salt and sodium bicarbonate overcomes the venous stasis. Strychnin and digitalis with the foregoing treatment soon puts the membrane in condition to resist the monochloracetic acid without the danger of an excessive slough. H. Gradle¹ described a condition of occlusion of the nares by a general edematous swelling of the membranes of both the septum and turbinates. It offers an elastic resistance to pressure with the probe, not pitting, but resuming its contour at once when pressure is withdrawn. He has found it to develop in 3 cases only following acute inflammatory attacks. The most efficient treatment consisted in restoring the patency of the nares by cocain tampons. Silver nitrate 2% and carboglycerin 10% had little effect. The condition is usually associated with vascular hypertrophies, which may be removed by the snare after the edema is reduced.

Hay-fever.—Beaman Douglass² prescribed the saccharated dried suprarenal gland as follows in hay-fever: One 5-grain tablet is taken every 2 hours, day and night, until some giddiness or palpitation is observed, or until the local examination shows that the remedy is controlling the vasomotor paralysis. After this is accomplished the frequency of the dose is gradually reduced to 2 a day and continued throughout the hay-fever season. If disagreeable symptoms occur because the dose is too rapidly decreased, the quantity should be again increased. H. Holbrook Curtis,³ from experiments in immunizing a neurasthenic woman to the perfume of certain flowers exposure to which induced severe prostration, was led to a similar trial of *artemisia* as a preventive of ordinary hay-fever. Most satisfactory results are claimed in the limited number of cases treated in 1899. The liquor ambrosiæ is recommended in dram doses between meals and at bedtime, beginning 2 weeks before the attack is expected, the dose to be increased to the point of toleration during the attack.

Atrophic Rhinitis.—Spencer⁴ reported a typical case of atrophic rhinitis in a child of 5 years without evidence that it was secondary. The child was well during the earlier months of infancy. Bronner⁵ said that atrophic rhinitis was extremely common among the mill-girls of the north of England. Atrophy began between the ages of 14 and 18. Ozena, on the contrary, began early, often in infancy, possibly owing to infection from purulent discharge at birth. As regards the smell, the children of the working classes often smell so badly that it would be difficult to detect the odor of ozena. Meyer⁶ stated that atrophic rhinitis was especially liable to develop after the exanthems, the atrophy being similar to the condition causing the disappearance of

¹ Laryngoscope, July, 1899.

² N. Y. Med. Jour., May 12, 1900.

³ Med. News, July 7, 1900.

⁴ Jour. of Laryn., Rhin., and Otol., Mar., 1900.

⁵ Jour. of Laryn., Rhin., and Otol., Mar., 1900.

⁶ Med. News, April 28, 1900.

adenoids after the same diseases. Douglass¹ found that **ichthyol** was always of benefit. After a cleansing douche he rubs in the ichthyol pure or in 50% solution. This produces a serous exudate and absorption of the leukocytic infiltrate. He has also used **carbon dioxid**, under Achilles Rose's direction, with gratifying results. [Protargol in 5% to 20% solutions is an excellent application.]

Ozena.—Hamm² states that **citric acid**, like all fruit juices, acts as a powerful deodorizer and completely removes the specific ozenic odor. It also possesses marked healing properties. Every morning the nose is cleared of pus and crusts; then by means of an insufflator powdered citric acid and sugar of milk, equal parts, are introduced t. i. d. Deodorization can be noticed at once, and lasts for several days, even if the process is not repeated. The author obtained a cure in several cases.

Nasal Diphtheria.—C. J. Symonds³ reports 2 cases of unilateral nasal diphtheria in boys without constitutional disturbance. In one case there had been a slight blood-stained discharge from one nostril for 10 days. The other had had repeated hemorrhage from one nostril for a week. After removing crusts and blood in each case, membranous exudate was found, from which cultures of the Klebs-Loeffler bacilli were obtained. The writer emphasizes the importance of bacteriologic examination of acute rhinitis associated with blood-stained discharge.

Angioma.—W. E. Casselberry⁴ removed with a cautery snare an easily bleeding, nodulated, soft, reddish tumor as large as a small bean, attached by a broad pedicle to the base of the cartilaginous septum at the anterior edge. The base was cauterized with chromic acid. No recurrence has taken place in 2 years. Microscopic examination showed many blood-vessels and blood-spaces.

Adenosarcoma of the Septum.—A. R. Baker⁵ in January, 1896, removed with the sharp curet a tumor that had been growing about a year from the cartilaginous septum of a woman aged 49. The base was cauterized with the electric cautery. The tumor had bled a little occasionally. There was no pain. Microscopic examination by H. W. Rogers showed nonmalignant adenoma. In February, 1898, the tumor recurred, rapidly extending almost to the nasopharynx. Rogers and others then declared it adenosarcoma. The writer then performed the Rouge operation, making an incision beneath the upper lip and turning the lip and nose up over the forehead. Nearly the entire septum was then removed with the tumor. Recovery was prompt and without deformity. There had been no recurrence when last seen—about 14 months later.

Echinococcus Cyst.—W. K. Rogers⁶ in 1895 removed a large fibroid polypus from the vault of the pharynx by means of forceps, and at the same time a medium-sized polypoid growth from the middle

¹ Med. News, April 28, 1900.

² Lancet, Sept. 6, 1899.

³ Laryngoscope, Oct., 1899.

⁴ Therapist, June 15, 1899.

⁵ Jour. Am. Med. Assoc., Feb. 3, 1900.

⁶ Jour. Am. Med. Assoc., Feb. 3, 1900.

turbinate. The latter was snared off. The stump of each was touched with the galvanocautery point. The nose was again obstructed $2\frac{1}{2}$ years later, when a violent effort to clear it by blowing caused an escape of much clear straw-colored fluid. Two months later the writer ruptured a cyst-like body while removing it with a snare. The microscope showed numerous echinococci hooklets in the walls. There was no recurrence in 2 years. The patient, a woman of 34, gave no evidence of intestinal parasites.

Headache from Nasal Disease.—Dundas Grant¹ notes the frequent cure of persistent headaches by the removal of adenoids, and describes cures of cases by the resection of part of the middle turbinate, and others cured by the opening of the frontal and sphenoidal sinuses. He concludes that the condition of the nasal cavity and sinuses must not be overlooked in cases of severe headache. [We have frequently had similar results after reducing the size of the inferior turbinate.]

Hypertrophy of the Inferior Turbinate Bone.—E. Harrison Griffin² makes a plea for the amputation of part of the lower turbinate with the saw when the nasal space is found too narrow after the tissues have been thoroughly reduced by the application of both suprarenal extract and cocain. In such cases the use of acids and the employment of cautery are inefficient. He introduces a small saw beneath the turbinate and makes his cut upward and inward toward the septum, being careful to carry the cut well back to the posterior portion of the turbinate. Hemorrhage is quickly stopped by introducing a plug of cotton well back. The suprarenal solution greatly diminishes bleeding during the operation and partly controls any secondary hemorrhage. No dryness of the pharynx or condition like atrophic rhinitis has been seen in 4 years' observation. [We formerly removed portions of the inferior turbinate with scissors rapidly and easily, but for several years have preferred the submucous reduction of the bone by the use of burs and trephines. This operation can be done quickly, and leaves the nasal chambers in a practically normal condition.]

Ostmann³ claims that all hemorrhage is avoided in the removal of posterior hypertrophies as follows: With a flat cautery-point a curved line is cauterized from behind forward just above the lower margin of the turbinate down to the bone, occluding the main vessels. The mass is then removed by the cold snare after tightening the loop for about a minute.

Nasal Use of the Galvanocautery.—Beaman Douglass,⁴ from microscopic study of sections of the turbinate at different intervals after cauterization, believes that the ordinary linear cauterization destroys too much superficial tissue. He would therefore discard the knife electrodes and use a small stiff wire-loop electrode, which can be made to penetrate

¹ Jour. of Laryn., Rhin., and Otol., Sept., 1899.

² N. Y. Med. Jour., Feb. 24, 1900.

³ Fraenkel's Arch., IX, 2, 200; Ann. of Otol., Rhin., and Laryn., Aug., 1899.

⁴ N. Y. Med. Jour., May 12, 1900.

the epithelium and hyaline membranes at a moderate heat. When the point has reached the deeper structures, the current can be increased, the hypertrophic tissue in the immediate vicinity destroyed, and the point withdrawn after again somewhat reducing the heat. About the only condition requiring cauterization of the septum is venous dilation of the sinuses of the tuberculum. Cauterization of the middle turbinate is hazardous and requires great care to avoid ethmoiditis or pachymeningitis. The edema of the tissue following cauterization can not be detected in the prepared slides, and the process of hardening shrinks the cells and removes any serous exudate. If true inflammation occurred, the leukocytic infiltration would be visible. The best results in the use of the cautery are obtained (1) on soft tissues; (2) its action is more favorable on tissues composed of excess of round-cell structures than in connective tissue; (3) the best effects follow its use for the destruction of blood-vessels—*e. g.*, the seats of chronic congestion rather than those structures that have gone on to subsequent marked hypertrophy or a polypoid form.

Turbinate Operation, Tonsillitis, Acute Rheumatism.—E. Kronenberg¹ describes a case in which the removal of papillomatous growths from the inferior turbinate was followed by tonsillitis. A similar operation on the other side a month later was followed by acute articular rheumatism, heart complications, and death.

Dilation of the Heart Complicating Nasal Obstruction.—John A. Thompson² calls attention to the congestion of the pharynx and turbinates associated with valvular heart disease. Certain observations seem to him to indicate that some obstructive diseases of the upper air-passages produce a dilation of the heart, if not actual valvular disease. He removed a large septal spur from a robust farmer aged 39. No chest examination was made at the time. Moderate temporary heart failure followed the application of cocain. Three days later the patient presented slight passive congestion of both lungs, a dilated left ventricle with apex to the left of the nipple line, and a loud mitral regurgitant murmur, with a pulse of 120 when quiet. A year later, after a course of digitalis, the nasal, heart, and pulmonary signs were normal and the pulse was 72. The writer advises careful examination of the chest before undertaking local operations. Local treatment of the mucous membrane filled with venous blood does little good. Success demands a combination of local and general treatment. [The dependence of the heart trouble upon the nasal lesion would appear more clearly if proper examination of the heart had been made before beginning the nasal treatment.]

New Nasal Scissors.—Carolus M. Cobb³ devised a nasal scissors with firm blades to amputate any part of the lower turbinate. (Fig. 101.)

Nasal Asthma.—McBride⁴ noted the association of asthma with

¹ Münch. med. Woch.; Jour. of Laryn., Rhin., and Otol., Nov., 1899.

² Ann. of Otol., Rhin., and Laryn., Nov., 1899.

³ Boston M. and S. Jour., May 7, 1900.

⁴ Jour. of Laryn., Rhin., and Otol., July, 1899.

polyps as less frequent than the occurrence of asthma with a hyperesthetic condition of the nasal mucosa, and the greater relative association with small polyps, probably because they are more mobile. In certain cases without marked abnormality of the nose the cauterization of sensitive or cough-spots on the membrane produces marked amelioration, amounting in some cases to practical cure. Even in the normal nose the cautery as a counterirritant may cause molecular changes in the center that is responsible for asthma. Waggett¹ described the cure of a case of asthma of 12 years' duration by the removal of a septal spur that pressed against the turbinate. Upon two subsequent occasions the asthma returned, and was relieved by breaking down synechias. Sir Felix Semon² confesses that he can not tell beforehand by any method of examination the prognosis as to nasal treatment for asthma. He divides the cases into: (1) Lasting success obtained, exceedingly small percentage; (2) temporary benefit, comparatively large percentage; (3) no success at all, very large percentage. To which classification St. Clair Thomson³ would add, (4) those who are considerably damaged by intranasal treatment. [We heartily sympathize with Felix Semon's views.]

Foreign Bodies in the Nose.—

D. S. Humphreys⁴ reported the removal of a cotton-seed from the nose of a child of three as follows: The nose-piece of a Politzer bag was introduced into the opposite nostril and suddenly compressed, when the seed flew out and half-way across the room. The screaming of the child closes the posterior nares and forces the air through the other nostril. Albert E. Bulson⁵ reports the case of a man who had been kicked by a horse 22 years before, and who lost two incisors, of which only one was found at the time. No symptoms were caused by the other tooth for 15 years, when the left naris became filled with fungoid granulations and the left conjunctival tract and lacrimal duct became inflamed and epiphora ensued from the constant purulent discharge. After the removal of the fungoid mass the writer recovered the tooth from the nasal cavity, and rapid recovery followed.

Nasal Splints.—Francis W. Alter⁶ devised a dilating metal splint for the after-treatment of operated deflected septum. It is introduced closed and then dilated or spread apart by a key. The writer prefers



Fig. 101.—Cobb's Nasal Scissors (Boston M. and S. Jour., May 7, 1900).

¹ Jour. of Laryn., Rhin., and Otol., July, 1899.

² Jour. of Laryn., Rhin., and Otol., July, 1899.

³ Jour. of Laryn., Rhin., and Otol., July, 1899.

⁴ Physician and Surgeon, July, 1899.

⁵ Med. Rec., Dec. 2, 1899.

⁶ Med. Rec., Mar. 31, 1900.

to leave it in place 5 days at a time. The splints are made in 4 styles: (1) curved side, perforated; (2) curved, without perforations; (3) both plates flat; (4) septal plate flat, outer plate concavoconvex. (Fig. 102.)

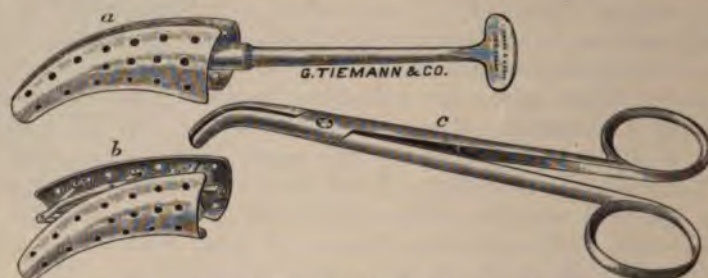


Fig. 102.—Alter's dilating nasal splints (Med. Rec., Mar. 31, 1900).

John W. Farlow¹ offered a splint devised by R. A. Coffin. (Fig. 103.) It consists of two nearly flat pieces of perforated silver, between which

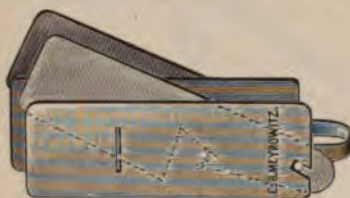


Fig. 103.—Farlow's septum splint (N. Y. Med. Jour., Sept. 9, 1899).

is an oval spring with a regulating rod to be turned by a key. It is claimed for it that it may be easily introduced; that it is adjustable to any width; that the patient can breathe through it and irrigate the nose; and that the septum unites smoothly after operation. Walter F. Chappell² devised an ingenious

splint to support the whole width of the septum, but folding up for ease in introduction. The illustrations indicate the mechanical principle. (Fig. 104.)

Accessory Sinus Disease.—L. Rethi³ advocates the negative air douche in the diagnosis of diseases of the accessory sinuses. After cleansing the nose, removing polyps, and applying cocain to the hiatus, a Politzer air-bag is compressed, the nozzle is introduced into the nostril of the affected side, both nostrils are compressed, and, while the patient swallows, the air-bag is allowed to expand suddenly. Careful inspection will then almost always reveal the seat of disease by the discovery of secretion sucked out of the affected sinus. Ernest Waggett⁴ summarizes his views as follows: (1) Acute frontal empyema nearly always ends in spontaneous recovery. (2) After a general involvement of the acces-



Fig. 104.—Chappell's septum splint (N. Y. Med. Jour., Jan. 27, 1900).

¹ N. Y. Med. Jour., Sept. 9, 1899.

² N. Y. Med. Jour., Jan. 27, 1900.

³ Jour. of Laryn., Rhin., and Otol., Jan., 1900.

⁴ Laryngoscope, Nov., 1899.

sory sinuses the frontal sinus is the first to recover. (3) The normal ostium is admirably situated for the purpose of drainage. (4) Consequently the mere fact that a frontal empyema is chronic affords presumptive evidence either that the ostium is abnormal and inefficient as a drain, or that some serious lesion (caries, polypus, etc.) exists in the sinus, incurable by mere irrigation. This chronicity necessitates a cutting operation. (5) Inasmuch as the external operation is safer, easier, and more effectual than any operation performed through the nose, it is desirable that all chronic frontal empyemas should be treated by external operation. Charters Symonds¹ divides cases of frontal sinus disease into: (1) Those in which there is purulent discharge from the nose with, as a rule, formation of polyps; (2) those in which there is distention of the sinus without nasal discharge; (3) those in which there is distention of the sinus with nasal discharge of pus. Whenever pus is seen around polyps, suppuration of one or more sinuses is indicated. He considered the pus the cause of the polyps. When polyps are very numerous, with much foul pus, the antrum is certainly involved, with or without the frontal sinus. He thinks pure frontal cases painless, with fewer polyps and with pus, as a rule, inodorous. After the removal of polyps he deemed the routine insertion of a probe and cannula in the frontal sinus necessary. After irrigating the cavity with boric acid solution or weak formalin, he suggested filling the cavity with an emulsion of iodoform and glycerin through the cannula, while the patient lies on a table or couch with the head hanging over the end. In this way from $\frac{1}{2}$ to 1 dram may be introduced. If this is impossible, the sinus may be full of polyps, necessitating an external operation, clearing the cavity, and enlarging the channel into the nose, followed by closure of the external incision. [Although most authors teach, either directly or by implication, that by enlarging the opening from the sinus to the nose free drainage may be established, so that the external opening can be closed, our observation has been that chronic empyema of the frontal sinus can not be cured in this way. We have found also that rubber drainage-tubes, although provided with large flanges at the nasal extremity, are liable to escape from the drainage channel into the frontal sinus. It therefore appears best to maintain a medium-sized external opening until the suppuration ceases.]

Röpke,² after exhausting conservative methods, operates after the **method of Kuhnt**, making a subperiosteal resection of the whole anterior wall of the frontal sinus. The contents are then scraped out, the meatus frontonasalis is enlarged by breaking away part of the inferior wall of the sinus, any diseased ethmoid cells are then curetted, the large cavity is stuffed with iodoform gauze, and the flaps are stitched except for a spot on the inferior supraorbital ridge, where the strip of gauze projects. In 3 days the strip is removed. Only one strip is used even if both sinuses are operated, the other wound being closed after cutting away the septum for drainage. In 25 cases thus operated upon, 12 had disease of both sides. When the cavities are abnormally large, the patients

¹ Laryngoscope, Oct., 1899.

² Laryngoscope, Oct., 1899.

are considerably disfigured. Knapp¹ modified Röpke's operation by leaving the upper orbital margin, which lessened the deformity. [The greater or less deformity will in most cases be found a serious objection to this operation.]

De Santi² saw an unusual case of **blocked subdermal lymphatics** of the face with edema of the eyelids and puffiness over the frontal sinuses simulating frontal and antral disease. The patient attributed the condition to mosquito bites received 3 months before.

John D. Paige,³ in a case of double empyema of the antrums, the ethmoid cells, and the left frontal sinus, opened both antrums through



Fig. 105.—Paige's case of double empyema of the antrums, ethmoid cells, and left frontal sinus (Boston M. and S. Jour., April 5, 1900).

the alveoli, opened and curetted the ethmoid cells, and irrigated the frontal sinus through the enlarged natural opening. E. R. Corson took the skiagraph, which shows the probe introduced into the frontal sinus. (Fig. 105.) The loss of bone in the superior maxilla due to the opening through the alveolus and the subsequent absorption show plainly. Numerous fillings in the teeth also appear.

Dundas Grant⁴ approves **experimental irrigation through the infundibulum**. He used Horstmann's cannula, and found that he could introduce it in about half the cases. Resection of the anterior end of the middle turbinate is also a very important measure

of treatment. In one case that procedure assisted recovery after the external operation had failed. If the infundibulum is curetted at all, a very free opening should be made to avoid adhesion.

D. Braden Kyle⁵ treated a case of left frontal sinus disease which opened spontaneously in the median line about 1 inch above the supra-orbital ridge. The patient had no acute pain, but there was edema externally and within the left naris. The frontal bone was found

¹ Laryngoscope, Nov., 1899.

² Jour. of Laryn., Rhin., and Otol., May, 1900.

³ Boston M. and S. Jour., April 5, 1900.

⁴ Laryngoscope, Nov., 1899.

⁵ N. Y. Med. Jour., Dec. 16, 1899.

necrotic over an area $\frac{3}{4}$ of an inch in diameter. A probe introduced found its way into the superior meatus. After irrigating with boric acid solution, followed by hydrogen peroxid, aqueous extract of hamamelis, and cinnamon-water, equal parts, the cavity was packed daily for 4 days with aristol gauze. Later the douching was followed by insufflations of boric acid and aristol for 2 months, when the sinus healed and all nasal discharge ceased without operative interference. The patient's general condition had been much impaired by an intercurrent attack of the grip, followed by a rheumatic or gouty condition, for which suitable remedies were used. The scar was slight.

For probing the frontal sinus Gustav Spiess¹ prefers the probe with a semicircular bend, the distance to which it must be introduced being from 60 mm. to 70 mm. He holds the probe high and lowers the handle only when the point enters the frontal canal. The position may be further verified by the fluorescent screen, though when the probe is felt to rub against the anterior wall, there is no doubt. To facilitate the process the middle turbinate may be forced toward the septum, or part of it resected. Probing will hardly succeed in more than half the cases. The diagnosis can be assured only by syringing. To facilitate syringing, he drills into the frontal sinus from the naris with a drill 3 mm. thick, watching the process by means of the fluorescent screen. He thinks that this operation should supersede the external operation when the disease is not serious enough to justify the latter. Luc² reports a fatal case of diffuse septic osteitis of the frontal bone following an operation on the frontal sinus in a patient who had previously undergone the Ogston-Luc operation without relief. Herbert Tilley³ reported a similar fatal case, and attributed the result to a possibly too free curetting, with opening of some diploic spaces which later became septic.

The Antrum.—Lambart Lack,⁴ after removing polyps from a patient with free purulent discharge from under the anterior ends of the middle turbinate, tried transillumination, both sides appearing dark and the patient having no sensation of light. Under gas the antrum drill was passed its full length through the alveolar margin without reaching any cavity. He then attempted puncture at two different places in the inferior meatus without success. He concluded that the antral cavity was too small to produce so much pus, which was probably due to ethmoid disease. Herbert Tilley⁵ suggested that he remove the anterior part of the middle turbinate and explore the antrum from the middle meatus. L. C. Cline,⁶ from a personal experience in 140 cases of disease of the antrum, found that 50% were due to diseased teeth, 40% to the grip and the teeth combined, 10% to ethmoiditis and various nasal obstructions; 20 acute cases complicated with influenza all subsided without operation; 120 cases were chronic suppuration of from 2 months' to 7 years' standing; 5 cases were bilateral; and of the rest, 75% were

¹ Jour. of Laryn., Rhin., and Otol., Nov., 1899.

² Laryngoscope, Oct., 1899.

³ Laryngoscope, Oct., 1899.

⁴ Laryngoscope, April, 1900.

⁵ Laryngoscope, April, 1900.

⁶ Jour. Am. Med. Assoc., Sept. 29, 1899.

on the right side. Operation revealed a swollen edematous condition of the mucous lining of 16 cases. In none did he find true polypoid growths. Curetting was done in 6, packing with iodoform gauze in 4 cases. The others yielded to hot astringent douches. Ethmoiditis was observed in 11 cases, all preceded by the grip. For diagnosis he relies principally on hydrogen dioxid and the position of the head. Of 118 cases operated on, all but 2 had 1 or more carious teeth, or decayed teeth had been removed. He prefers opening through the alveolus for drainage and because the after-treatment is less painful. In every case opened under the gingivomoid fold he had a swollen cheek from infection from the discharge. He drills a small hole first; then applies cocaine and enlarges the opening. Some cases do well without a tube, stopping the opening with cotton frequently changed. For a tube, he uses a silver wire turned so as to form a shoulder on one end. The time of cure varies from 3 weeks to a year, but the estimate includes a large percentage of the cases.

J. Dennis Arnold¹ described a case of antrum disease associated with a **chronic discharge from the lacrimal duct** of the same side. Opening the antrum, curetting, and irrigating relieved the acute symptoms, but 8 months' treatment failed to cure. On introducing a Bowman sound No. 1 into the lacrimal duct, the end appeared in the middle meatus, thus accounting for the connection between the disease of the duct and the antrum. Fluid injected through the duct escaped from the antrum. Five weeks' treatment effected a cure.

Lichtwitz² noted 5 cases in which the opening of the antrum through a floor of excessive thickness by the trephine or bur was followed a few weeks later by the rejection of a tubular **sequestrum**, representing the walls of the operative canal. The accident is doubtless due to overheating the instrument. He now uses a special helical bur, and interrupts the drilling frequently to permit the instrument to cool.

W. R. Ackland³ devised a **set of instruments for opening and treating the antrum through the alveolus** (Fig. 106): 1 is the borer; 2, a measurer to indicate the length of tube required; 3, the tube-carrier, to screw the tube (4) into place (the tube, of silver gilt, has a screw-thread on the outside, and is provided with a split-pin stopper); 5 is a two-way nozzle, exactly fitting the tube, for irrigation. It is possible to extract a tooth, enlarge the opening, and introduce the tube under one administration of gas.

Cyst and Mucocoele.—W. Scheppegegrell⁴ thinks that a majority of the reported cases of hydrops and mucocoele, and even some cases of empyema, are due to cysts. These cysts, either single or multiple, may be caused by the dilation of a follicle in the mucous lining of the antrum, by cystic degeneration of a polypus, or by dentigerous cyst. If the cyst completely fills the antrum, and either ruptures into the nasal cavity or is opened by operation, it presents the appearance of a chronic empyema.

¹ Pacific Rec. Med. and Surg., June, 1899.

² Jour. of Laryn., Rhin., and Otol., Feb., 1900.

³ Brit. Med. Jour., June 2, 1900.

⁴ Med. Rec., Aug. 26, 1899.

Transillumination is unreliable as a means of diagnosis, though it will differentiate a cyst from a solid tumor. He describes a case in a man of 42 who had severe pain in the region of the left eye and cheek for several days. A diseased second bicuspid had been removed 15 months before, and that region was then very painful. Transillumination was negative. An opening was drilled through the alveolar process. No discharge occurred, but on introducing a probe a firm membrane was encountered. Puncturing this, a viscous nonfetid secretion was evacuated, with relief of the pain. Fluids could not be forced into the nose from the antrum until the opening was enlarged and the cavity curetted. The cavity was packed with iodoform gauze changed daily for 3 days, and later syringed daily with warm boric acid solution for a few weeks until cured.

Asthma and Antrum Disease.—W. Richardson¹ described two cases in which opening an antral abscess caused immediate cessation of

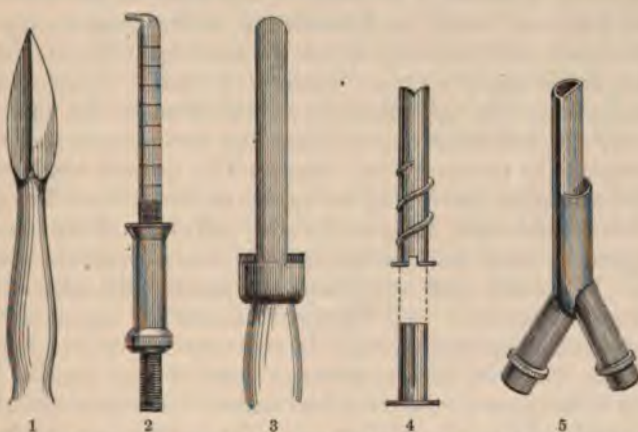


Fig. 106.—Ackland's set of instruments for opening and treating the antrum through the alveolus (Brit. Med. Jour., June 2, 1900).

severe asthma. Each case was associated with decayed bicuspid and molars, which were extracted, and the antrum was cleaned through the alveolus. Eight weeks after operation the opening closed, in one case causing a return of nasal discharge and asthma, both of which were cured by reopening the cavity and treating it for a week. Whether the asthma was caused by the presence of pus in the antrum or by its discharge through the naris it was impossible to determine.

Sphenoidal Disease.—Samuel Lodge, Jr.,² saw a fatal case of sphenoidal disease in a syphilitic pawnbroker aged 31. The patient's face was swollen on the right side for two months, with severe pain and a bloody purulent discharge from the right nostril. The antrum was explored and found normal. The nasal discharge came from the superior meatus, and necrosis of the cribriform plate was diagnosed. As the discharge was very free, no surgical interference seemed advisable, but

¹ Laryngoscope, Aug., 1899.

² Laryngoscope, Mar., 1900.

vigorous antisyphilitic treatment was carried out. A few days later meningitis developed, resulting in death. Necropsy showed that the cribriform plate of the ethmoid and the ethmoid cells were normal. To the right of the sella turcica there was some necrosis of the walls of the sphenoidal sinus, with much pus covering the base of the brain.

Mouth-breathing.—B. Fraenkel¹ found 3 or 4 cases of mouth-breathing due to abnormally short frenum of the upper lip, preventing closure of the mouth. The patients were free from adenoids and a slight operation on the frenum corrected the difficulty.

Adenoids.—Leopold Chauveau² uses the Gottstein curet without anesthesia, regardless of the age of the child, from the new-born up. The introduction of the curet in the new-born is facilitated by depressing the base of the tongue strongly. The child is supported on the knees of an assistant. He operated on over 50 new-born infants in this manner without accident. [From our observation, it is exceedingly rare that an operation for adenoids is necessary or advisable in the new-born.]

A. W. Calhoun³ notes the **prevalence of deafness** among children with adenoids. He finds that direct pressure upon the mouth of the Eustachian tubes rarely occurs. Perhaps the aural symptoms are due to an extension of the inflammatory process through the tube into the middle ear. Mouth-breathing changes the air-currents and alters the pressure about the mouth of the tubes. The growth hinders the free action of the muscles controlling the lumen of the tubes. The condition ends in chronic catarrhal otitis media with ankylosis of the ossicles. A true suppurative otitis also not infrequently results from the presence of adenoids. When any such symptoms are present, the adenoids should be thoroughly removed. A. Plottier⁴ found 20 cases of adenoids among 38 deaths from diphtheria. In two cases the curet removed adenoid tissue covered with false membrane. One of these patients had false membrane in the fauces; the other had none. In cases of diphtheria the writer strongly advises examining the nasopharynx, preferably by palpation followed by suitable local treatment. Finally he urges the removal of all adenoids in order to avoid the increased liability to infection by diphtheria. [We would not favor the removal of adenoids that cause no obstruction to respiration or interference with the Eustachian tube. It is probable that a small amount of adenoid tissue is present in a large proportion of children, and the fact that many cases are found in diphtheria does not seem to justify the operation in cases of slight enlargement.]

Robert N. M. Dawbarn⁵ objects to the term adenoid, as these growths are open-meshed lymph-nodes. The bad results of large pharyngeal and faucial tonsils are: (1) the high narrow arch of the palate; (2) insufficient development of the upper jaw; (3) irregular and imperfect dentition; (4) tendency to dental decay, to stomatitis, and to

¹ Laryngoscope, Nov., 1899.

² Gaz. hebdom. de méd. et de chir., April 8, 1900.

³ Va. Med. Semi-monthly, Aug. 11, 1899.

⁵ Phila. Med. Jour., July 8, 1899.

⁴ Laryngoscope, Aug., 1899.

gingivitis. The factors in causing the high-arched palate are: (1) the pull exerted by the enlarged tonsil and adherent pillar when dragged downward in swallowing; (2) the narrow superior dental arcade begins to articulate with the inner or lingual side of the inferior dental arcade; (3) the rise of the palate is assisted by the negative air-pressure in the nasal cavities due to lack of use in respiration; (4) the weight of the soft tissues in infants, assisted by the hanging lower jaw, still further narrows the upper jaw; (5) it is a stigma of degeneration in some individuals; in others, a matter of family inheritance; (6) in mouth-breathers the molding effect on the palate of contact with the tongue is lacking. As to prevention, he suggested allowing infants to suck their thumbs, though of course recognizing the possible effects in protrusion of the upper incisors. The advantage of thumb-sucking lies in making nasal breathing certain and in the suction on the palate from below.

Richard Sachs¹ removed an adenoid the size of a walnut, with a modified Gottstein curet under chloroform, from a boy of 10, who died 4 days later from constant **hemorrhage**. When the bleeding became serious, the mother stated that her father had died of parenchymatous bleeding from the kidney, and that the boy had bled 4 days after the extraction of a tooth, and that he bled seriously after cutting his finger slightly. [Before operating, inquiry about abnormal bleeding should always be made.]

J. A. Stucky² reports a fatal result following removal from a boy of 15 of a tonsil with the tonsillotome and adenoids with Gottstein curet under chloroform. The tonsil gave exit to pus from an old peritonsillar abscess, and it was greatly dilated and fungous. The gums also were soft and spongy. Two hours later a sharp hemorrhage was checked by iced spray and stopped after the application of persulphate of iron. Nine hours after operation death occurred. The writer attributed the result to sepsis before the operation complicated with a **hemorrhagic diathesis**. W. A. Martin³ removed adenoids from a boy of 16 with Gottstein's knife under cocain anesthesia with moderate bleeding. Violent bleeding occurred an hour and a half later, requiring plugging. In the case of a boy of 7 bleeding began the second day after operation, and recurred at intervals until the fourth day, when plugging became necessary. In the third case, a girl of 6, he operated under chloroform anesthesia, giving relief to the symptoms for 2 months, after which the adenoids seemed to develop again. With Gottstein's knife he then tore the growth loose, but had to use forceps to remove it. Nine days later violent bleeding occurred, requiring rest in bed for 3 days.

E. Furniss Potter⁴ removed adenoids from a woman aged 47 with forceps under anesthesia. She had always been a mouth-breather and her hearing was impaired. Within a week or two after operation the hearing was considerably improved. Owing to the age of the patient

¹ Jour. of Laryn., Rhin., and Otol., Feb., 1900.

² Ann. of Otol., Rhin., and Laryn., May, 1899.

⁴ Jour. of Laryn., Rhin., and Otol., June, 1900.

³ Laryngoscope, July, 1899.

a diagnosis of sarcoma had been made by others, but microscopic examination showed that the mass was adenoid tissue that had undergone inflammatory changes.

Louis J. Lautenbach¹ discards anesthetics on account of the danger, and uses the **finger-nail to remove adenoids**. This, he claims, is quite

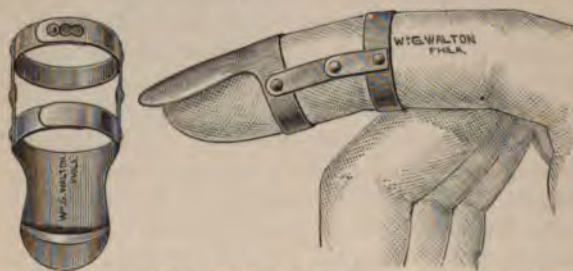


Fig. 107.—Lautenbach's artificial finger-nail (Jour. Am. Med. Assoc., Nov. 18, 1899).

sufficient when the nail is in good condition. At other times he reinforces it with an artificial finger-nail. (Fig. 107.) This operation is completed in 2 or 3 minutes with but little hemorrhage, and is scarcely

more severe and disagreeable than the usual finger examination. [This may be efficient in very soft growths, but certainly can not be in ordinary cases.]

Postnasal Polypus.—H. R. Coston² removed a polypus weighing 1 ounce and $3\frac{3}{4}$ inches in length from the nasal pharynx of a girl of 12. Both nares were completely blocked by the mass, which hung in the throat a half inch below the velum palati. It was impossible to introduce a snare through the nose. After applying cocain, the writer drew the pharyngeal part of the growth as far down and forward as possible with a tenaculum and then grasped it with a large dressing forceps, but was unable to twist it off. Finding by manipulation that it was attached to the septum just at the opening of the right posterior naris by a pedicle as large as his little finger, he severed the attachment by his finger-nail and withdrew the tumor, together with another filling the right naris and two long flattened polyps. The tumor was nearly a pure myxoma. The nasal lobe was large and had caused considerable deformity of the nose by pressure.

Postnasal Sarcoma.—Scanes Spicer³ reported the removal of a sarcomatous tumor requiring division of the soft and part of the hard palate from a man aged 65. Butlin confirmed the diagnosis by the microscope. A tender lump deep behind the ramus of the jaw was considered also malignant by the writer, but operation was deferred. Seven months later the external tumor enlarged and became painful. It was removed by Bernhard, who found that it was a chronic lymphadenitis with suppurative foci free from malignancy or tubercle, from which the writer concludes that secondary enlargements of external cervical glands are not necessarily malignant.

Foreign Body in Nasopharynx 18 Years.—H. S. Berkitt⁴ reports removing under anesthesia a tailor's thimble incrustated with con-

¹ Jour. Am. Med. Assoc., Nov. 18, 1899.

² N. Y. Med. Jour., Aug. 5, 1900.

³ Jour. of Laryn., Rhin., and Otol., Jan., 1900.

⁴ Jour. of Laryn., Rhin., and Otol., Aug., 1899.

cretions from the nasopharynx of a woman aged 23. She had "worn it" there for 18 years. The catarrhal and ear symptoms caused by its presence entirely disappeared under ordinary treatment after its removal.

A Remarkable Accident.—J. W. Bird¹ describes a remarkable accident that befell a man aged 24, who ran into a wire clothes-line in the dark. The wire caught in his teeth and tore out nearly all the left superior maxillary, with its 8 teeth attached. The unusual feature of the case is that there is no perceptible scar or deformity of the face.

Vegetable Parasites of the Mouth.—Carl Röse² recommends 50 % alcohol as the best application for all forms of vegetable parasites of the mouth. If other antiseptic is used, the 50 % alcohol is the best vehicle for it. The writer claims for it a specific healing effect on the diseased oral mucous membrane.

Iodin Eruption on the Palate.—G. Milian³ noted the occurrence of acute burning pain in the palate, with ecchymosis and submucous hemorrhages, and with other symptoms of iodism, in a woman aged 43, who had taken 1½ drams of potassium iodid daily for 6 days.

Argyria from Pharyngeal Applications.—M. Menzel⁴ reports a case of argyria due to frequent application of a 5 % to 10 % solution of silver nitrate to the pharynx and larynx during a period of 9½ years. The face, neck, and back of the hands were discolored, darker when congested and steel-gray when anemic. Upon stopping the applications for 2 or 3 weeks, the patient became restless, irritable, and unfit for work, these symptoms subsiding when the applications were renewed. The author thinks that the argyria will very slowly disappear if the solution is withheld for a long time. It is doubtful whether potassium iodid or other remedies affect this condition.

Pharyngitis.—Seymour Oppenheimer⁵ claims that: (1) The pharyngeal mucosa of the mill-hand under 20 years of age is more susceptible to unfavorable influences than is that of the individual over this age; (2) the inhalation of dust, fibers, and chemical agents is the factor of most importance; (3) the majority of industrial workers are affected with pharyngeal disorders, dependent to a certain extent upon their occupation; (4) in those affected with pharyngitis before assuming these occupations the morbid changes are augmented by the work; (5) the primary pharyngeal changes are those of acute congestion and inflammation; chronic changes are the ultimate result; (6) the pharyngitis produced in part or wholly by the occupation does not differ in any respect from the ordinary forms; (7) provided the nasal chambers are in approximately normal condition, pharyngeal affections are much less liable to occur than otherwise; (8) hygienic measures applied to the environment of the worker are of vast benefit as regards the improvement of his general condition, and therefore of the upper respiratory tract; (9) local care, as has been outlined, will be productive of much good. [While very many mechanics have pharyngeal disorders, probably only a limited

¹ Laryngoscope, Oct., 1899.

² Münch. med. Woch., Sept. 5, 1899.

³ Presse méd., Sept. 30, 1899.

⁴ Laryngoscope, Oct., 1899.

⁵ Med. Rec., Dec. 16, 1899.

number can attribute the trouble to their occupation. It should be remembered that a large number of mechanics and artisans are smokers.]

The Tonsils.—F. E. Hopkins¹ removed the tonsils and adenoids of a girl of 13 under ether in December, 1896. Counterpressure was made over each tonsil upon application of the guillotine. Examination 3 weeks later showed the excision to be thorough. The patient had suffered severely with repeated tonsillitis before the operation. Subsequent attacks were less severe, but the left tonsil was found considerably enlarged and was removed 5 months later. Chas. E. Clark² thinks that **chronic lacunar tonsillitis** (1) should be studied and treated individually, and not under the general term hypertrophy of the tonsils; (2) it is capable of acting as a center of infection; (3) a diagnosis should be made with precision by means of cocain and the use of retractors, curets,



Fig. 108.—Tonsil punch-forceps (Tilley, in *Lancet*, May 5, 1900).

probes, etc.; (4) the sinuses should be treated as a sinus in any other locality—viz., by excision. [We have found the quickest and most effective treatment thorough cauterization by the galvanocautery.]

Herbert Tilley³ devised a **tonsil punch** (Fig. 108) for the removal of large flat tonsils which can not be engaged in the ring of an ordinary guillotine. Such tonsils are long vertically, and this instrument attacks them from before backward, much more rapidly than cauterization or other methods.

Gaudier⁴ removed a rapidly growing small-celled **sarcoma** involving the left tonsillar fossa of a man aged 35. There was no pain, tenderness, fever, or glandular enlargement. The growth was so rapid, interfering both with swallowing and breathing after 15 days, that it was at first thought to be an abscess. The patient died of pneumonia over a month later.

Tonsillar Abscess.—George A. Leland⁵ advocated discission of the tonsil to relieve abscess of either the tonsil or the circumtonsillar tissue, from the fact that such abscesses frequently start from within the

¹ N. Y. Med. Jour., Dec. 2, 1899.

² Kansas City Med. Rec., July, 1899.

³ *Lancet*, May 5, 1900.

⁴ L'Echo Méd. du Nord., Sept. 24, 1899.

⁵ N. Y. Med. Jour., Oct. 7, 1899.

tonsil in one or more of the lacunæ. He splits the tonsil by introducing a sickle-knife into the lacunæ and enlarges the opening downward with a sterilized finger-tip, thus securing drainage at the lowest point. The sinus is thus thoroughly explored, and the method gives better results than opening through the velum palati, as the exact location of pus by the latter method may require several incisions. A little ether inhaled in the Rose position to secure through relaxation of the jaws makes the operation painless.



Fig. 109.—Gage's aspirator (N. Y. Med. Jour., Dec. 16, 1899).

Mary E. Bates¹ reports rapid atrophy of the tonsils of a youth of 18 who had suffered from frequent attacks of quinsy under the use of 5-grain tablets of **thyroid extract**. Julia Seaton Kapp² reports the rapid subsidence of an acute tonsillitis by the use of the same remedy without the formation of an abscess, which the patient had frequently experienced.

Aspirator for Pharyngeal Abscess.—George W. Gage,³ to avoid

¹ Woman's Med. Jour., Jan., 1900.

² Woman's Med. Jour., Jan., 1900.

³ N. Y. Med. Jour., Dec. 16, 1899.

the danger of suffocation in the operation of opening pharyngeal abscesses, devised an aspirator with a guarded hypodermic point and a curve to follow the tongue. If the pus is thin, the aspirator attachment is unnecessary. (Fig. 109.)

Papilloma of the Tonsil.—J. Payson Clark¹ removed with a snare a papilloma from the tonsil of a boy of 8. A smaller growth had been removed 3½ years before from the same tonsil.

Infection through the Tonsils.—Emil Meyer² stated that certain forms of infectious diseases followed closely upon tonsillar affections, the same micro-organisms existing in both. Chief among the diseases thus acquired is rheumatism, though the list includes other noninfectious diseases, such as albuminuria, erythema, urticaria, etc. One writer reported 4 cases of angina pectoris, another a case of phlebitis, while still others mentioned pneumonia and pleurisy. He would also add endocarditis to the list. He related the death of a youth aged 18 from general pyemia consequent upon tonsillar disease. *Staphylococcus aureus* was found in the tonsils and also in the lungs and in the deposits on the pulmonary valves.

Fibrolipoma of the Epiglottis and Pharynx.—E. Fletcher Ingals³ with a uteriné éraseur and No. 8 piano wire removed a large fibrolipoma attached to the right side of the base of the tongue and pharynx of a farmer aged 28. The tumor had been growing for 5 years, and was beginning to interfere seriously with swallowing, speaking, and breathing. The growth was so firm that on 3 occasions No. 5 piano wire in an ordinary snare broke during attempts at removal. The first part removed was largely fibrous tissue. Ten days later a mass of lipoma was snared off, and subsequently 3 other pieces were removed. The small portion remaining in the vallecula was removed with cutting forceps and the point of attachment cauterized. Three months later there had been no recurrence, but the right side of the epiglottis was adherent to the pharyngeal wall, though the patient had no difficulty in swallowing.

Thyroid Tumor of the Tongue.—J. E. Schadle⁴ saw a tumor that had been growing 6 months from the base of the tongue of a woman aged 25. Though of good weight, she was anemic, and complained of gastric disturbance and insomnia. The tumor was a deep purplish-red, and during the time of apparently suppressed menses it became very vascular. It was hard and immovable, and underneath the jaw the same induration was noticed. There was no pain, and the only function disturbed was speech, the voice being thick and non-resonant. After exploring the tumor with a needle and finding that it bled profusely, the writer used electrolysis, reducing the tumor to about one-third its original size in 2 months. McBurney a few weeks later diagnosed the growth as a myxoma or adenomyxoma, and advised enucleating it through an incision beneath the chin. The microscopist reported that the growth was doubtless an accessory thyroid gland.

¹ Laryngoscope, Feb., 1900.

³ N. Y. Med. Jour., Dec. 9, 1899.

² Med. Rec., Dec. 9, 1899.

⁴ Jour. Am. Med. Assoc., Aug. 12, 1899.

Diabetic Ulceration of the Throat.—W. Freudenthal¹ divides diabetic ulcers into the malignant and benign. In the former treatment is ineffective, death certain. In the case of a man of 70, diabetic for 4 years, with extensive ulceration of the larynx, injections of the following **orthoform emulsion** effected a cure: R. Mentholi, 2.0 to 10.0; Ol. amygdal. dulcis, 30.0; Vitelli ovi (about), 25.0; Orthoform, 12.5; Aqua dest., q. s. ad 100; ft. emulsionem. The throat is first cleansed with an ordinary spray. If there is excessive secretion, the larynx may be swabbed and anesthetized with cocain, after which as much of a syringeful of the emulsion is introduced as the patient will tolerate. Daily treatments are recommended. [Could not orthoform be applied more easily and quite as effectively in powder?]

Lupus.—Scanes Spicer² described a peculiar extensive ulceration of the membranes extending from the nasal septum over the sides and posterior wall of the nasopharynx and pharynx down to the vocal cords, and involving the epiglottis, which was pale and seamed with antero-posterior cicatrices. The patient was a youth without other evidence of tuberculosis or syphilis. The ulceration was painless, continuous for 5 years, and superficial. The surface was dry, covered with a glazed pellicle, and did not readily bleed. The soft palate was almost gone, but the hard palate was intact. The writer's diagnosis by exclusion was lupus, an opinion shared by Semon largely on account of the condition of the epiglottis.

Graves' Disease and Myxedema.—Maurice Faure³ describes the case of a woman of 32 who began to develop symptoms of Graves' disease with complete exophthalmic goiter in 6 years' time. Then cardiac insufficiency developed. The next year both conditions improved, after which for 3 years myxedema developed. In the eleventh year cardiac insufficiency became serious, myxedema increased, and death occurred in asystole. Postmortem, the thyroid was found 3 times as large as normal and pressing on the cervical sympathetic. The coexistence of exophthalmic goiter and myxedema in this case for at least 2 years would indicate that the former can not be due to increased secretion and the latter to diminished secretion by the thyroid gland, unless the function of the gland can be altered in two directions at the same time. No changes were found in the medulla to support the bulbar theory of Graves' disease.

Iodism and Goiter.—L. Gautier⁴ noted the peculiar susceptibility to iodine of patients with latent or evident goiter. Thus, painting the gums with tincture of iodine, dressing an alveolar abscess with iodoform, or even residence near the sea, gave rise to acute thyroidism.

Epidemic Laryngitis.—Chas. Gibbs⁵ reports an epidemic of laryngitis and tracheitis on board the steamship "Oriental," conveying troops from England to South Africa. There were 120 cases among

¹ Ann. of Otol., Rhin., and Laryn., Nov., 1899.

² Jour. of Laryn., Rhin., and Otol., May, 1900.

³ La Presse méd., Sept. 23, 1899. ⁴ Rev. méd. de la Suisse Rom., Oct. 20, 1899.

⁵ Brit. Med. Jour., April 28, 1900.

1000 men. The symptoms began with shivering, or nausea with vomiting. The temperature rose to 102° or 104° F., in one case to 105° F. The patients complained of sore throat, referring the pain to the thyroid cartilage and the region of the thyrohyoid membrane. Pain on swallowing was also referred to the epiglottis and below it. The pain was more severe at night, and cough was severe with some spasm of the glottis. There was no enlargement of the neck or glands in any case. After a day or two the inflammation extended to the trachea and produced sternal pain and soreness. There was no redness or swelling of the tonsils or soft palate, and only slight congestion of the pharynx in the worst cases. The nares and conjunctivæ were normal. The voice became husky and harsh for a day or two, and later was often lost for a few days. The temperature, after the initial rise, dropped to about 101° F., and remained there a week, then descended by lysis to normal on the tenth day. The treatment was palliative and did not affect the course of the disease. The cases increased in number as the ship approached the equator, so that taking cold could hardly be a factor. The writer thinks it was due to infection by some germ.

The Larynx in Typhoid Fever.—Lorenzo B. Lockwood¹ quoted statistics as to the frequency of ulceration of the larynx in typhoid fever as follows: Schrotter, 3%; Heimer, 1.57%; Griesses, 14.74%; Holscher, 5.3%; Landgraf, 29.2%; the percentage thus varying greatly with the virulence of the epidemic. Reports from necropsies offer greatly increased percentages. The introduction of the Brand or cold-water treatment has greatly reduced these figures, thus establishing Ziemssen's claim that the vulnerability of the mucous membranes depends to a great extent upon the temperature. As to the etiology, he separates the lesions into: (1) specific, due to the direct infection of adenoid tissue, corresponding to the lesion of Peyer's patches; (2) non-specific, due to ptomaines, secondary bacteria, decubitus, or diphtheria. The specific typhoid ulcer is always crater-shaped, with prominent and infiltrated edges. The secretion may be hemorrhagic. But even when the destruction of tissue is extensive, these ulcers show a remarkable tendency to recovery as the general disease improves. The Gaffsky bacillus has been observed in a few cases. These ulcers are accompanied in the first few days by chills, and, if severe, by cough and hoarseness. Catarrhal laryngitis and pharyngitis never occur before the sixth day of the disease. The symptoms are mild and easily overlooked unless laryngoscopy is performed. At the end of the second week mild epithelial mycotic necrosis may occur, especially on the free border of the epiglottis. A more severe form is characteristic of severe typhoid, and the diagnosis is therefore unfavorable. Diphtheria is a complication of typhoid of great rarity, but absolutely unfavorable as to prognosis. It is usually accompanied by ulceration, cartilage necrosis, perichondritis, and pneumonia. Laryngeal edema as a primary affection may occur in the second week or during convalescence, and is always fatal. The secondary edemas vary in severity, but scarification in the mild forms and

¹ N. Y. Med. Jour., July 30, 1900.

tracheotomy in the more severe save many cases. Laryngeal paralyses occur in typhoid, but do not differ essentially from other paralyses.

Laryngitis.—Dundas Grant¹ recommends the following solution, applied at weekly intervals by the wool applicator in cases of laryngitis characterized by white swelling of the mucous membrane: *R.* Acid. salicylic., grs. v to xxv; Spts. rect., 5v; Glycerin., 5iij. The same application is valuable for interarytenoid hypertrophy and for papillomas. The application is irritating, and the first few should be preceded by cocain anesthesia.

Recurrent Papillomas.—Bronner² found that papillomas became smaller and more rounded under the use of **formalin** sprays for 3 months. The patient was a man of 49 years who had had similar growths removed by forceps at intervals for years. The solution was used at first 1 : 2000. Later the strength was increased to 1 : 250.

Conditions of the Throat and Larynx Simulating Tuberculosis.—Lennox Browne³ said that obstructive lesions of the nose, as hypertrophic rhinitis, posterior hypertrophy, or septal spurs and deviations, are the conditions liable to set up disturbances in the fauces leading to laryngeal irritation. Hard obstructions are more liable to lead to pre-tuberculous laryngitis, because there is less chance of variation and remission than is the case with soft hypertrophies. He finds that attacks of laryngitis extending to the bronchial tubes, and even further, which come as a sequel to influenza, have a natural tendency to recovery. In 2 cases of infiltration of the posterior commissure associated with signs of phthisis, one proved to be clearly specific, while the other was chronic laryngitis, probably nonspecific. In the case of a physician who sold his practice on account of supposed tubercular disease, the amputation of a relaxed uvula caused entire recovery. In another case associated with tuberculosis of the lungs amputation of the uvula led to abeyance of the symptoms for 8 years, with recovery from an acute bronchitis. Varix at the base of the tongue or enlarged veins in the uvula may cause serious symptoms. In a patient with violent cough and marked consolidation of the lung with tubercle bacilli, removal of a large lingual tonsil by the cautery, with intralaryngeal applications of guaiacol, caused recovery. In several cases he noticed the presence in the sputum of *Micrococcus tetragenus*, which is becoming generally recognized as giving strong premonition of tuberculosis. [A critical analysis, the results of which were presented to the British Medical Association at its meeting in Montreal, of between 800 and 900 cases from our private practice has appeared to indicate that nasal obstruction has little if any relation to laryngeal and pulmonary tuberculosis. Some who have reached different conclusions seem to ignore the frequency of nasal obstructions in the nontuberculous. The analysis referred to showed the percentage of persons suffering from such obstruction to be greater in the healthy than in the tuberculous.]

Stricture of the Larynx.—Lambert Lack⁴ successfully dilated

¹ Laryngoscope, Nov., 1899. ² Jour. of Laryn., Rhin., and Otol., Feb., 1900.

³ Jour. of Laryn., Rhin., and Otol., May, 1900.

⁴ Jour. of Laryn., Rhin., and Otol., Aug., 1899.

a stricture of the larynx in a child aged 6 who had worn a tracheotomy tube for a year following diphtheria. There was a large ulcer with much granulation tissue just below the vocal cords. O'Dwyer's tubes failed to dilate the resulting stricture. Under chloroform the stricture was dilated with curved forceps passed through the tracheotomy wound. A plug was worn in the larynx for 5 months, after which it was withdrawn and the trachea tube corked up. A month later the tube was dispensed with, and recovery was complete.

Combined Intubator and Extubator.—Chas. J. Whalen,¹ after experiments with the French and the "Rational" intubation sets, found that neither was satisfactory, especially for extubating, either on the cadaver or the living patient. In the O'Dwyer also it is necessary to have separate obturators for each size of tube used, adding to the expense of the set. The writer therefore combined both introducer and extractor in a new instrument (Fig. 110), whose major axis is always



Fig. 110.—Whalen's introducer and extubator (Jour. Am. Med. Assoc., June 2, 1900).

fore and aft, thus avoiding as an introducer all difficulty in adjusting it to the tube. The lock also prevents the tube from slipping when used as an extubator. The tubes have a funnel-shaped opening at the top and the lower end is cut off at an angle of 45 degrees, slanting from right to left to facilitate the passage of the tube between the vocal cords. The hard rubber metal-lined tubes are ideal, being light enough to be expelled if the lumen is occluded, while not being easily dislodged by coughing.

Malignant Disease of the Larynx.—Chas. H. Knight² said that a unilateral lesion of the larynx in a patient past middle life, with a husky voice, was presumably malignant. Wright³ said microscopists showed a tendency to make a diagnosis of malignancy whenever the border-line between epithelium and stroma was confused. Personally, he never felt justified in making a diagnosis on such grounds. He wanted to see the cells growing in the lymph-spaces.

J. N. Mackenzie,⁴ omitting the subject of a possible cancer bacillus, recognizes three methods of diagnosis: (1) The naked-eye appear-

¹ Jour. Am. Med. Assoc., June 2, 1900.

² Laryngoscope, Mar., 1900.

³ Laryngoscope, Mar., 1900.

⁴ Jour. of Laryn., Rhin., and Otol., June, 1900.

ancæ combined with the clinical history; (2) thyrotomy, as offering a more complete examination of the parts; (3) microscopic examination of the removed fragment. The removal of a part generally stimulates the malignant growth so that it marks the beginning of the end. He therefore condemns it. While thyrotomy is permissible, it might not give certain information, especially in the diffuse infiltrative forms. As to treatment, an antitoxin will probably be discovered some time. At present total extirpation, with complete ablation of the neighboring glands and lymph-channels, is the only safe procedure. If the disease approached the middle line, the removal of tissue should be early and complete. When the growth is small, papillomatous in appearance, and seen very early, circumscribed, not in the median line and not especially malignant looking, we might remove half the larynx, though the remaining half is of no particular use in voice production. If there were no evidence of infiltration in the pedicle, we might possibly be justified in removing simply the growth as it appeared. He condemned intralaryngeal operation in cases of extensive disease and expressed the opinion that simple thyrotomy with curettage was not up-to-date surgery.

Mistaken Diagnosis.—Felix Semon¹ reported an interesting case of supposed malignant disease of the larynx, in which tracheotomy had been done but laryngectomy had been abandoned by Watson Cheyne, owing to numerous apparently infected glands being exposed by the preliminary incisions. The patient was a man, aged 39, whose voice had become gruff and who complained of soreness near the larynx and of some difficulty in swallowing. The right vocal cord was fixed in the cadaveric position and the mucous membrane over the right arytenoid and the adjoining portion of the plate of the cricoid was much tumefied. There was general fullness of the glands externally. An indefinite history of chancre years before caused the writer to prescribe iodids for some weeks. The condition became worse, until operation was decided on. The patient continued to wear the tube for 11 months, and the enlargement of the glands, after increasing for a month, began to subside, and the voice improved with de Santi's speaking apparatus. Upon examination no glands could be felt externally; the right vocal cord remained fixed as before, but the tumefaction of the larynx had disappeared. The patient had taken Clay's mixture, a preparation of Chian turpentine, which the writer could not believe would have been effective in cancer.

Laryngeal Neuroses.—J. A. Stucky² reported a case of **laryngeal chorea** in a neurotic single woman of 23. She had undergone a variety of operations, including the removal of both ovaries, for dysmenorrhea. She had a peculiar barking cough, with frequent aphonia for 5 years. The recumbent position aggravated the cough, which did not cease during sleep except when sleep was produced by a full dose of morphin. She had been subject to colds since childhood. The application of cocain solution to the turbinates during an acute rhinitis stopped the coughing.

¹ Laryngoscope, Mar., 1900.

² Ann. of Otol., Rhin., and Laryng., Aug., 1899.

Application to the hypertrophied turbinates of chromic acid fused on a probe completed the cure. [This might well be called nasal chorea.]

F. E. Hopkins¹ cured a case of **hysterical larynx**, accompanied by spasm and a cough that sounded like the squeal of a hurt pig, by simple intubation. The patient was a growing girl of 15, anemic and nervous, but not appearing like a hysterical subject. She had had pertussis in June, 1897, the cough later assuming the sound of a shrill squeal, both inspiratory and expiratory. Cautery of the base of the tongue in November, 1897, was followed by brief improvement. Later general anesthesia was given to control the attacks on different occasions. Then large doses of conium and morphia were tried. A year after first seeing her the thought of giving the patient and the community a rest suggested the intubation. The tube was retained only an hour, but the cure was permanent.

Hysterical Aphonia.—Middlemass Hunt² examined the larynx of a woman aged 27 who had been aphonic for several years following a severe nervous shock. In time she acquired a deep rough voice, due to the ventricular bands coming together on efforts to phonate, while the glottis apparently remained open. A second shock, due to seeing a man wounded, restored her natural voice, though the cough remained hoarse and gruff.

Defective Speech and Cerebral Function.—G. Hudson Makuen³ notes that the inability to speak, as from tongue-tie, may cause functional disturbance of cerebration that leads to a diagnosis of idiocy. The test is a course of systematic speech-training, which may be considered as specific treatment for all those purely functional disorders of the brain in which defective speech is a prominent symptom, whereas in cases having organic disease its value may be limited.

The American Voice.—J. W. Farlow⁴ thinks that the condition of the nose is not the determining factor in the causation of the nasal twang so commonly noticed in Americans. By dividing the patients into 3 classes by the ages 12 and 30 years, he finds that the youngest class, while most often having a nasal voice, is less subject to nasal lesions than the second class. In the third class also the nasal voice is less common than earlier in life. The voice can often be improved by training, without medicinal or surgical interference, and pathologic states have more to do with the range and power of endurance of the singing voice than with the quality in the median register. The nasal voice is more often a matter of imitation. Good public speakers and actors often have poor vocal organs from a purely anatomic point of view.

The False Cords in Phonation.—Donovan,⁵ from a study of the false cords in 150 patients who tolerated examination, found approximation to occur in 62%, increasing with the production of high tones.

¹ N. Y. Med. Jour., Dec. 2, 1899.

² Jour. of Laryn., Rhin., and Otol., July, 1899.

³ Phila. Med. Jour., Dec. 16, 1899.

⁴ Boston M. and S. Jour., Sept. 14, 1899.

⁵ Monatsch. f. Ohrenh., Jan., 1899.

Those showed the greatest mobility that were convex inward during quiet breathing. The approximation is usually greatest in the middle, but sometimes the anterior thirds approach most closely, leaving a triangular interval behind. In the intonation of an aspirate both the true and false cords separate in every case. When the closure of the glottis was interfered with, vicarious movements of the false cords occurred in some cases, coming together more or less completely, thus assuming the function of the true cords, but producing a rough voice, capable of but little modulation. In normal closure of the glottis the movements of the false cords may be considered as associated movements connected with the action of the vocalis muscle, or, more properly, as active movements contributory to the closure of the glottis.

Singers' Nodes.—A. Rosenberg¹ attributes singers' nodes to obstructions of the mouth of the gland of the vocal cord, described by Fraenkel 10 years ago. Obstruction results in a swelling of the gland or dilation of the duct. Excessive use of the voice in this condition causes hyperplasia of the epithelium through friction of the tumor on the edge of the other vocal cord, or through an increase of connective tissue. The tumor then becomes permanent. The posterior part of the cords do not come in contact upon phonation when both cords are affected by nodes, but a triangular slit remains between them.

Vocal Defects and Muscle Training.—G. Hudson Makuen² notes the importance of the action of the larger extrinsic muscles in the production of the voice. They effect it by determining the position of the larynx to the adjacent structures, and by determining the position of certain important parts of the larynx in their relation to other parts. The correct position of the larynx is probably in close approximation to the spine, the posterior surface of the cricoid fixed against the fifth cervical vertebra. These muscles, which also affect the action of the tongue and the soft palate, may be brought under the control of the will either collectively or in pairs. Appropriate exercises are described.

Chronic Croup.—Edwin Rosenthal³ noted the frequent occurrence of stenosis after apparent recovery following the removal of intubation tubes worn for 10 days, and in some cases where intubation had not been necessary. In one case occurring 5 weeks after diphtheria only streptococci were found, and the stenosis subsided promptly after the injection of 10 cc. of antistreptococcic serum. In one case of diphtheria he had used 20,000 units of antitoxin. It was his custom to use antitoxin immediately, and, if streptococci are found, to use antistreptococcic serum also.

Hiccup.—L. Kolipinski⁴ obtained complete relief in an alarming case of hiccup by firm pressure on the base of the tongue by means of a large spoon-handle.

Suffocation by Broken-down Tuberculous Glands.—S. E. Allen⁵ reports an interesting case of suffocation due to broken-down

¹ Laryngoscope, Oct., 1899.

² Med. Rec., July 15, 1899.

³ Jour. Am. Med. Assoc., Oct. 7, 1899.

⁴ Maryland Med. Jour., Feb. 25, 1899.

⁵ Laryngoscope, Oct., 1899.

tuberculous glands filling the trachea through a perforation near the bifurcation. The patient was a well-developed 4-year-old boy, the picture of health. There was no tuberculous heredity except that a maternal aunt had died of tuberculosis. In May, 1899, the child began to have severe attacks of dyspnea, expiration being more difficult than inspiration. He also coughed on the slightest irritation. During sleep the breathing was quite natural. After a few days' observation in the hospital a foreign body in the trachea seemed the only possible diagnosis. Tracheotomy was done and the trachea explored with a probe without discovering any foreign body. The tube was worn for 5 days, after which the wound was allowed to heal. A month later death occurred suddenly. Postmortem examination revealed the condition previously stated.

ANATOMY.

By C. A. HAMANN, M.D.,

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OSTEOLOGY.

The Varieties and Structure of the Patella of Man.—The various forms ascribed by E. M. Corner¹ to the human patella are the triangular, elliptic, oblique, and circular, of which the first type is found the most frequently in over 50 %, while the oblique and elliptic shapes predominate in the female sex. The compact osseous tissue, which varies in thickness in different specimens, and which is better developed in the male, is found most abundantly at the insertion of the quadriceps tendon and along the anterior surface. Toward the apex, which may be undeveloped, and is most evident in the large triangular variety, it is said to be practically absent. The cancellous tissue of the interior is densest near the articular surface. In its upper half distinct fibers run at a right angle to the two surfaces, while in the lower portion they are more or less oblique. As compared with the patella of quadrupeds, this bone in man has lost the greater part of its function, not being subjected to the great strain of the naturally flexed leg. In these animals others, as the biceps and gracilis, are inserted into it, and it is not the relatively thin broad bone that is found in the human subject.

The Congenital Absence, Origin, and Purpose of the Patella.—Wirth² concludes that the patella is a dismemberment of the upper tibial epiphysis, and not, as heretofore thought, a sesamoid bone. According to his observations, it seems to be a disappearing structure, in one case having been congenitally absent during three generations of one family.

The Architecture of the Tibia.—E. Albert,³ in the description of the tibial structure, says that the cancellous lamellæ at the proximal end have an oblique course, and so appear in different sections of this bone as a number of distinct bundles. Sagittally an anterior and a posterior bundle arise respectively from the anterior angle and posterior surface, which freely intercross each other, especially beneath the spine of the tibia. In coronal section the posterior of these bundles appears

¹ Proc. Anat. Soc. Gr. Brit. and Ire., Feb., 1900; Jour. Anat. and Phys., vol. XIV, part III, p. 27.

² Arch. f. Chir., Bd. LVIII, Heft 4, S. 900-917.

³ Wien. med. Woch., Nos. 4, 5, and 6, 1900.

as a medial and lateral bundle, arising from these surfaces, and for the greater part running perpendicular to the articular surface of the tuberosities. The lower end of the tibia in coronal section also shows a medial and a lateral bundle, the innermost lamellæ of which cross over to the opposite side, the lateral becoming more and more perpendicular. The cancellous network, which is densest beneath the articular surfaces of both epiphyses, appears radially at the popliteal notch and incisura fibularis. The shape of horizontal sections of the diaphysis is variably triangular at different levels; at both ends, however, it is quadrangular.

A Case of Dehiscence of the Inferior Wall of the Osseous Auditory Canal, and the Protrusion into It of the Bulbus Venæ Jugularis.—J. Graber¹ describes a case of dehiscence on the inferior wall of the osseous auditory canal in a woman 49 years of age. The bulbus venæ jugularis protruded into the separation, being visible for quite a distance, and without causing an interruption in the tympanic membrane. Several such cases are stated to have been seen without having been put on record.

Malformations of the Palate and Their Connection with the Nose, Eye, and Ear.—Malformations of the palate, says Danziger,² are commonly associated with a similar condition of both superior and inferior maxillæ, especially the former. Too early fusion of basisphenoid and occiput, shortening the space between the foramen magnum and the base of the nose, also impairs the growth of the maxillary bone. The palate, in such a case, is pressed on from all sides, and from its inability to curve, it becomes pointed, and the nose and nasopharynx are encroached upon and narrowed. Deflection of the nasal septum has for its causative factor a high-curved palate. In many palatal anomalies eyes and ears are affected. The deficient growth of the basicranium accounts for this, as it disturbs the growth of the orbits. Hyperopia and strabismus result. That this same hindrance in the development of the temporal bone may lead to deafmutism is indicated in many cases by the horizontal position of the tympanic membrane.

Description of a Specimen in Which there is a Rudimentary First Rib Along with 13 Pairs of Ribs and 25 Presacral Vertebrae.—A. Low³ describes a specimen of rudimentary first rib associated with 13 pairs of ribs, 25 presacral vertebrae, and other anomalies. The rudimentary rib, that of the left side, articulated with both the seventh and eighth vertebrae and had a false joint anterior to the tuberosity. It was directed almost straight forward from its tuberosity to the anterior cartilage-covered extremity, from which a fibrous band 18 mm. long extended to the costal cartilage. The rib of the right side also articulated with the seventh and eighth vertebrae, but otherwise was normal. The lateral borders of the manubrium bore facets for the second costal cartilages, the right being placed about the middle; the left, a little higher. The third pair of costal cartilages articulated at the usual position of the second pair, and the eighth joined the sternum at the junction of the

¹ Monatsch. f. Ohrenh., No. 1, 1900.

² J. F. Bergman, Wiesbaden, 1900.

³ Jour. Anat. and Phys., vol. XIV, part IV, p. 451.

gladiolus and ensiform cartilage. The sacrum, which was apparently composed of its usual number of segments, derived its last vertebræ from the first coccygeal, and the first sacral segment existed free as the twenty-fifth vertebræ.

A Case of Congenital Absence of the Fourth and Fifth Ribs with Polymastia.—Stori¹ describes a case of congenital absence of the left fourth and fifth ribs, in a male 26 years of age, in which the heart lay partly beneath the skin. An accessory mamma, with fully developed mammilla and areola, occupied the depression caused by the absence of these bones.

Mechanical Disturbance During the Growth of Bone.—The hypertrophy and atrophy of bone said to result from mechanical disturbances is, according to H. Maas,² only apparent, as there is neither an increase nor a decrease in size or number of its composing elements. In experiments conducted on rabbits the limbs were incased in plaster casts, and growth, when hindered by pressure in one direction, always took place in another. Structurally, such pressure caused the condensation of the bony lamellæ in the spongiosa, and the tendency of the intervening spaces to become obliterated, so that it gave it the appearance of compact bone. Scoliosis and tibiæ valgæ are said to be good examples of such mechanical disturbances in man. The vertebræ, where pressed upon and hindered from growth in height, became wider and more compact. In rachitis from the same cause the softened spongiosa at the ends of the epiphysis becomes denser, and grows in width, giving rise to the characteristic enlargements at these positions and to the shortening of bone. The curving of bone always begins at the epiphyseal ends, and is due to the more active growth in the direction of least resistance. Periosteal osseous formation in such cases is greatest where unhindered; *i. e.*, toward the concavity. Accordingly, the cortex is thickest here, and the medullary canal is displaced toward the side of the convexity. Another reason for the short bones of rickets is to be sought in the fact that the Haversian lamellæ also increase in width at the expense of their longitudinal growth, accounting for the denseness and lamellated appearance of the osseous tissue in this disease. The vascularity of the marrow in such bone is due to the compression of the cancellous spaces.

The Development of Some Centers of Ossification in the Fetus and New-born.—The center of ossification at the lower femoral epiphysis, which Nobiling³ examined in almost 2700 fetuses and new-borns, may be present as early as the seventh month. Most commonly it appears at the eighth month. Its size in some cases was quite variable. In a few large and heavy new-borns only a trace of ossification, or not even this, was found, while in some weak and emaciated full-term infants the center of ossification was quite large. Its developmental stages in both femurs may also vary, and occasionally two centers occur in one epiphysis. The presence or absence of a center of ossification can not, therefore, be regarded as conclusive proof of full term.

¹ *Mintore zoologica italiana*, Anno XX, No. 3, pp. 77, 78.

² *Berl. klin. Woch.*, No. 6, 1900.

³ *Deutsche Praxis*, No. 19, S. 3.

The sternum, inclusive of the xiphoid cartilage, has a variable number of centers: viz., from 2 to 7, and even 10. These appear at about the sixth month, and not, as heretofore thought, at the seventh month.

MYOLOGY.

The Musculus Levator Glandulæ Thyroidæ and Similar Prelaryngeal Muscles.—According to its position and innervation, Eisler¹ distinguishes three different categories of the levator glandulæ thyroidiæ muscle:

(1) *Levator glandulæ thyroidiæ anteriores ventrales*: A muscular slip derived from the cricothyroid muscle, lying in or near the median line, and supplied by the superior laryngeal nerve. It arises from the hyoid bone or thyroid cartilage, and extends to the isthmus, the pyramidal lobe, or the base of the lateral lobe of the thyroid gland. (2) *Levatores laterales*: An indistinct muscular slip, derived from the musculus thyroideus, and supplied by the hypoglossal nerve. It extends from the tuberculum thyroideum inferior to the border or median surface of the lateral lobe. (3) *Levatores posteriores dorsales*: Another indistinct muscular slip, derived from the surface of the musculus constrictor pharyngis inferior, and supplied by the vagus. Origin, cricoid cartilage; insertion, median surface of the lateral lobe.

Report of a Musculus Sternalis.—A curious musculus sternalis, or rather a musculus sternalis compositus, is recorded by R. Frick.² This anomaly consisted of two portions, one of which represented a musculus pectoralis superficialis, the other an ordinary musculus sternalis. Both portions united at the third sternocostal articulation. Its double innervation—the anastomosing branches of the nervi thoracales and second and third intercostal nerves—indicated its derivation from the pectoralis major and rectus abdominis.

ANGIOLOGY.

Two Specimens of Bilocular Hearts.—Symington³ presented before the Anatomical Society of Great Britain and Ireland two specimens of bilocular hearts. In the first specimen, that of a male 3 years of age, the external appearance seemed normal. On section, the auricular and ventricular cavities of both sides were found to be continuous, and the interauricular opening, which admitted the index-finger, was bounded on the posterior wall, roof, and floor by a sickle-shaped fold; the ventricles, of which the left was much the larger, intercommunicated through an opening situated a little below the aortic orifice, and which was about the size of the little finger. But two orifices—a 3-cusped aortic and a mitral opening—were present. The

¹ Anat. Anz., Bd. XVII, Nos. 10, 11.

² Arch. f. Anat., Hefte 3 and 4, pp. 193, 194.

³ Proc. Anat. Soc. Gr. Brit. and Ire., Feb., 1900; and Jour. Anat. and Phys., vol. XIV, part III, pp. XIV-XIX.

interventricular septum, which represented the septum inferior of His, consisted of a thick muscular mass with a free concave border. In the second specimen, which was removed from a girl of 16, the auricular cavities were also continuous, a sickle-shaped membranous ridge indicating the line of separation between the two. In the right auricle, which was about twice the size of the left, a shallow fossa marked the position of the tricuspid orifice. A thick muscular ridge was the only evidence of a ventricular septum. Both aortic and pulmonary arteries opened out of the right ventricle. Owing to the fact that both these hearts when removed were severed without the ductus arteriosus, the condition of this channel could not be demonstrated.

A Pericardial Sac in Which the Large Azygos Vein Pierced the Sac Before Opening into the Superior Vena Cava.—C. M. Cooper¹ reports a case of somewhat extensive pericardium occurring in a male 26 years of age. The origin of the right and left pulmonary artery, the ductus arteriosus, the ascending aorta, and the lower two-thirds of the circumference of the aortic arch were all found on dissection to be included in this fibrous envelope. The vena azygos major for about an inch lay free within the pericardial cavity, before emptying itself into the superior vena cava, $1\frac{1}{2}$ inches from the auricular opening.

The Motor Nerve-endings in the Cardiac Muscle of Vertebrates.—Researches upon this subject, including all classes of the vertebrates, lead A. E. Smirnow² to conclude that each cardiac muscle-cell has its special nerve-ending, and that these are to be regarded as different from the nerve-endings of all other muscle-fibers. The intramuscular plexuses appear, in the different staining methods he employed, to be composed of varicose nerve-fibers. These varicosities are, however, only apparent, as they are formed by thickenings of a granular substance found between the fibrillæ of these fibers upon the free surface of each muscle-cell; the fine varicose fibrillar bundles given off from the intramuscular plexuses terminate as free telodendrites, of varying shape and extent. As the fibrillar bundles pass along the muscle-cells, they have a zigzagged or undulating course, and occasionally seem to dip down into the cellular substance. In fishes, amphibia, and reptiles the nerve-endings have a larger area of extension than in birds and mammalia. This, however, is counterbalanced, especially in the mammalia, by the greater number of these nerve-endings, so that the area of extension is comparatively a larger one.

The Petrosquamosal Sinus.—Anatomy and Pathologic Importance.—A. H. Cheattle³ calls attention to the pathologic importance of the petrosquamosal sinus. This sinus is more or less evident in the great majority of skulls, but especially so in the infantile, where its anterior termination in the middle meningeal vein and its posterior valve-like opening at the lateral sinus can be plainly seen. In the adult the posterior portion is frequently bridged over by bone. Its various venous tributaries from the tympanum, meninges, and occasionally from

¹ Jour. Anat. and Phys., vol. XIV, part III, p. 426.

² Anat. Anz., vol. XVIII, Nos. 4 and 5, p. 105.

³ Laryngoscope, Oct., 1899.

the temporosphenoidal lobe, easily explain the grave complications which may arise from affections of the middle ear.

The Persistence of the Venæ Umbilicales and the Ductus Venosus Arantii after Birth.—A microscopic lumen in the ductus arteriosus of adults is said by O. Kirchbach¹ to be constant. The venæ paraumbilicales, of which one or more were present in the 21 cases examined, are said to originate from a network of obliterating tissue which invades the lumen of the vena umbilicalis after birth.

The Arteriæ Superficiales and Arteriæ Comitantes of the Lower Extremity.—G. Salvi² discusses the arteriæ saphena magna and parva, also the arteria comitans nervi peronei, which occasionally occurs in man. In the lower animals these arteries are a normal occurrence.

On a Hitherto Unrecognized Form of Blood-circulation in the Organs of Vertebrates.—Minot³ describes a new connection between vertebrate blood-vessels, which, not being capillaries, he has proposed to name "sinusoids." These are found amid the tissues as a system of irregular branching spaces, lined by a single layer of endothelial cells. Sinusoids are said to predominate in the pronephros and mesonephros, liver, heart, adrenals, parathyroids, carotid, and coccygeal glands.

The Cause of the Shape of Nonnucleated Red Blood-corpuscles.—W. Myers⁴ advances the theory of dehydration to explain the biconcavity of the nonnucleated red blood-cells. According to this hypothesis, which assumes the existence of an enveloping noncontractile membrane, the abstraction of the cellular fluid contents accounts for the characteristic shape of the red corpuscles. Ordinarily, these blood-cells remain in a state of equilibrium with the hypertonic blood-plasma, as the outer layers of the cell contain probably less water, and so offer a certain resistance to any further dehydration.

Obliteration of the Inferior Vena Cava.—A. Civalleri⁵ reports a case of partial obliteration of the inferior vena cava which occurred in a child. The portion obliterated lay between the renal and hepatic veins, the collateral circulation being established by the hypertrophied renal, lumbar, and left hemiazygos veins. Obliteration of this portion of the inferior vena cava need not, as seen in this case, endanger life.

Note upon the Lymphatics of the Vermiform Appendix.—The deficiencies that occur in the muscular coat of the appendix, especially along its mesenteric border, and that serve to establish a continuity between the lymphatics of the submucous and subperitoneal tissues, are referred to by C. B. Lockwood⁶ as the hiatus muscularis. This existing free communication shows the possibility of rapid inflammatory action spreading in ulcerative processes of the mucosa. The numerous lymph-follicles in this layer are surrounded at their bases by the follicular or

¹ Inaug. Dissert., 8 Königsberg, 1, p. 51.

² Monitor zoolog. ital., Anno x, pp. 2 and 28.

³ Proc. Boston Soc. Nat. Hist., vol. XXIV, 1900, pp. 185-215.

⁴ Jour. Anat. and Phys., vol. XIV, part III, p. 351.

⁵ Gior. d. R. Accad. di med. d. Torino, vol. v, Anno LXII, F. 4.

⁶ Proc. Anat. Soc. Gr. Brit. and Ire., Nov., 1899; and Jour. Anat. and Phys., vol. XIV, part III, p. IX.

basilar lymph sinus, which in cases of appendicitis may be greatly distended or obliterated, either by compression or by the accumulation of great numbers of lymph-corpuscles. From the subperitoneal tissues, the lymphatic vessels coursing through the mesoappendix may pass through the appendicular gland at the ileocecal angle, or the ileocolic, situated behind that fossa, either to the glands of the mesentery or to those posterior to the ascending colon. The lymphatic vessels of the appendix may also pass to the iliac fossa into the glands along the external iliac artery. Those passing through the appendiculo-ovarian ligament empty into the glands of the right pelvic wall which lie near the internal iliac artery and vein.

The Lymphatic Vessels and Glands of the Kidney.—Networks of lymphatic vessels are found, as stated by Stahr,¹ in the perirenal fat, fibrous capsule, cortex, and probably, although not as yet demonstrated, also in the medulla of the kidney. All these lymphatics anastomose directly with each other and also at the hilus, from which a variable number of vessels lead to the lymphatic glands. These have a longitudinal shape, and are grouped among the upper lumbar glands in two rows, one each on the left and right sides, external to the aorta and vena cava. Between these two vessels a third group of glands exist, which connects the glands of both sides and receives the lymphatic vessels of the testicle and ovary.

Concerning the Topography and Etiology of Retropharyngeal Glandular Abscesses.—Retropharyngeal lymph-glands group themselves around two positions, in one of which the glands, small and inconstant, are situated between the posterior pharyngeal wall and the buccopharyngeal fascia. Of these, the one most frequently present lies opposite the upper portion of the body of the axis, at its junction with the odontoid process. To the other of these two groups, which usually comprises one constant gland, A. Most² has applied the name of *glandule pharyngeales laterales*. This gland, which occasionally may be multiple,—i. e., 2 or 3,—lies amid the buccopharyngeal fascia, near and median to the internal carotid artery, at about its entrance into the carotid canal, so placing it approximately at the level of the soft palate and posterior to the tonsil. These two groups of glands, well marked in youth, tend to atrophy with advancing age, when all but the *glandule pharyngeales laterales* disappear. The areas drained by these retropharyngeal lymph-glands are the posterior and upper portions of the pharynx, the nose with its accessory sinuses, and probably also the internal ear. Inflammatory diseases of these parts in the young probably account for the occurrence of idiopathic retropharyngeal abscess, which Most believes to be a suppurative lymphadenitis, and accordingly proposes the term "retropharyngeal glandular abscess" in its stead.

The Structure and Functions of Hemolymph Glands.—Hemolymph or hemal glands, structures of whose distribution in the mammalia little as yet is known, are not, as stated by W. B. Drummond,³ to be

¹ Arch. f. Anat. and Phys., S. 41, 1900.

² Arch. f. klin. Chir., vol. LXXI, Heft 3, p. 615.

³ Jour. Anat. and Phys., vol. XIV, part II, p. 198.

classified as a variety of the ordinary lymph-gland. In his researches—conducted on the sheep, dog, and rat, where they occurred in various positions amid the prevertebral fat, and also in other locations—certain differences were noticed. A subcapsular sinus, crossed by fibrous septa, was constantly present, well filled with blood, frequently with hyaline cells, containing in their interior either red blood-cells or their pigment. Hemolymph glands in structure also bear a resemblance to the spleen, the capsule and trabeculae containing unstriated muscular fibers. Large quantities of blood pigment frequently occur in them, which seems to indicate that their function, besides the formation of leukocytes, also includes that of red blood-cell destruction. Accessory spleens are in all probability hemolymph glands.

SPLANCHNOLOGY.

The Stomach and Pylorus.—From an examination of 50 stomachs, R. J. H. Berry¹ concludes that a cardiac valve is constantly present, or at least in 50 % of all cases. This valve, which projects downward from the upper and posterior portion of the cardiac opening, has a crescentic shape, and although small (from 2 mm. to 5 mm. in depth), is supposed to be functional. From its suspended position, in which it may swing either way, its resistance can easily be overcome by the acts of eructation and vomiting. The pyloric orifice was definitely determined to be oval, 14 mm. \times 18 mm., with the longest axis running obliquely from above down and backward, although occasionally the direction of this axis may be vertical or horizontal. An occurrence heretofore not recorded—accessory pyloric valves of crescentic shape and variably situated—was found in several cases. Of the dimensions, ascertained under the fullest distention, the greatest width was found to be 13.1 cm., and the length, as measured from the top of the fundus to the lowest point of the greater curvature, 27.8 cm. The transverse diameter, which is contained $2\frac{1}{2}$ times in the vertical, is shown by comparison to exceed the anteroposterior. In the female the cardiac valve is more frequently found, and the stomach being more tubular in shape, it has a greater relative length. There is also a greater difference between the small and greater curvature, which in the male is as 1 : 3.

The Form of the Empty Bladder and its Connections with the Peritoneum ; together with a Note on the Form of the Prostate.—A. F. Dixon,² whose preliminary note on the shape of the empty bladder has already appeared in print, writes a more detailed account of this subject. The four most fixed points of the contracted viscus—viz., the attachments of the urachus, urethra, and ureters—determine the angles of a flattened inverted tetrahedron. The four well-defined surfaces are the superior, two inferolateral, and the posterior, or base. The base, which is usually described as in relation with the rectum, is

¹ Jour. Anat. and Phys., vol. XIV, part III, p. 153.

² Jour. Anat. and Phys., vol. XIV, part II, p. 182.

altogether separated from it, below the peritoneal cavity, by the seminal vesicles and vasa deferentia. In the distended bladder the area of relation between it and the rectum is probably produced by raising the peritoneum of the rectovesical pouch. The peritoneum covering the superior surface is reflected along the lateral borders, which extend from the point of entrance of the ureters to the point of attachment of the urachus to the pelvic wall. This reflection corresponds to the lateral false ligament. Posteriorly, a small peritoneal pouch is often formed between the bladder and vas deferens, which recess is supposed to represent the uterovesical pouch of the female. The rectovesical pouch, or Douglas' pouch in the female, would be more applicably termed in both sexes the *rectogenital pouch*, as in the male it lies between the rectum, seminal vesicles, and vasa deferentia. For the same reason the rectovesical and uterosacral ligaments would better be named the *sacrogenital folds*. At birth the bladder does not correspond to this tetrahedral form, but is torpedo-shaped, the long axis extending between the apex and urethral opening, which at this time lies posterior to the openings of the ureters. With the descent of this organ into the pelvis the inferior portion probably bends forward, so giving rise to the lateral angles, the points of attachment of the ureters, and also changing the direction of the long axis of the seminal vesicles from downward and backward to downward and forward. The fetal bladder is often crossed by one or more peritoneal folds, extending between the abdominal rings, and assumedly produced by the dragging on the peritoneal membrane during the formation of the inguinal pouches. In the adult the plica vesicalis transversa is the probable representative of this fold. The prostate is described as somewhat conic in shape; its base, which looks upward and forward, has an anterior and two lateral angles, and is separated from the bladder, on superficial view, by a deep groove. Of its 3 surfaces, 1 is posterior and 2 are lateral. The urethra does not pierce the apex of the prostate, but rather at a point above and anterior to it, on the border separating the two lateral surfaces anteriorly.

On the Musculature of the Duodenal Portion of the Common Bile-duct and of the Sphincter.—The existence of a sphincter muscle at the duodenal end of the common bile-duct has been demonstrated by W. F. Hendrikson¹ in the rabbit, dog, and man. In man the sphincter muscle is an independent structure, the bile-duct, in penetrating the intestinal wall, separating the fibers of both longitudinal and circular muscularis, a few muscular fibers being there interchanged. The muscularis of the gall-bladder and bile-ducts consists of 3 layers—transverse, longitudinal, and diagonal. In the cystic duct the transverse fibers enter into the formation of Heister's valve, as do also a few of the longitudinal, but not so the diagonal fibers.

The Elastic Tissue of the Spleen.²—Elastic tissue in the spleen is found in the capsule and trabeculae, but mostly in or near the vessel-walls. In the adventitia of the arteries it either remains close to the

¹ Anat. Anz., vol. XVII, Nos. 10 and 11, p. 197.

² S. v. Schumacher, Arch. f. mikr. Anat.

vessel-wall, or surrounds the Malpighian bodies. In the media each muscle-fiber is inclosed in a fine membrane of this elastic tissue. The intima of venous capillaries is similarly inclosed in such a membrane.

On Some Congenital Malformations of the Colon, Causing Habitual Constipation in Children.—The congenital malformations causing habitual constipation in children are enumerated by Concetti¹ as follows: (1) *Macrocoly*, in which the sigmoid flexure and descending colon, being increased in length, are apt to double upon themselves and form sharp bends, especially so in narrow infantile pelvis. With advancing age and the growth of the child this condition tends to disappear. (2) *Megacoly*: The longitudinal and transverse diameters of the large bowel are increased, the walls are thickened by connective tissue, and the glandular function is disturbed. (3) *Ectacoly*, consisting in an ectasy of a portion of the colon, with or without dilation and hypertrophy of the surrounding tissues, and probably also a defective nerve supply. This and the preceding malformation have already been described as Hirschsprung's disease.

On the Development of the Villi of the Human Intestine.—According to Berry,² the development of the villi in the human intestine progressively follows the types of the lower animals. At first the intestinal mucosa is smooth, as in the lower vertebrates; later, longitudinal folds appear, which, increasing in size and breaking up, gradually give rise to the villi. With the age of the embryo these villi increase in number, so that old and young villi are at one time found side by side in the human intestine. The upper portion of the intestine is the seat of their appearance, and also of the largest number.

NERVOUS SYSTEM.

Nerve-cells of the Human Cortex.—H. B. Thomson's³ estimation shows that 1.37% of the whole cerebral cortex in man is composed of nerve-cells, of which there are about 9,200,000,000. That the pyramidal fibers of the spinal cord are the processes of the giant cells is apparently shown by their approximately equal numbers.

The Choroid Plexuses of the Lateral Ventricles of the Brain.—Their Histology, Normal and Pathologic (in Relation to Insanity).—The basis of the choroid plexus of the lateral ventricles is stated by Findlay⁴ to be like that of the pia arachnoid of the cerebral surface, consisting of a fine network of white fibrous tissue, with but few yellow elastic fibers. The veins throughout the plexus are tortuous, markedly resembling cavernous tissue. The smaller arteries have a thin adventitia and extend into the villi, which, being very vascular, contain each an artery, a vein, and intervening capillaries. Medullated nerve-fibers could definitely be said to exist only in the deeper parts of the plexus. Upon the free surface the epithelial cells are either single or many

¹ Arch. f. Kinderh., Bd. XXVII, Hefte 5 u. 7.

² Anat. Anz., Bd. XVII, Nos. 12-14, p. 242.

³ Jour. of Comp. Neurol., vol. IX, p. 113.

⁴ Brain, 1899, Summer, p. 161

layered, of an irregular outline, granular, with a large nucleus and vacuoles. Concentric pathologic bodies are present in most men, especially in the mentally afflicted, and are caused partly by proliferating endothelial cells undergoing degeneration and partly by a hyaline degeneration of the arteries and capillaries.

The Normal Structure of and Some Pathologic Changes in the Human Hypophysis Cerebri.—The cells in sectional views of the anterior lobe of the hypophysis cerebri appear in 3 different forms, which, according to Bender,¹ are functional stages. Flesh's chromophilic cells, cells larger than these with granular protoplasm and nucleolus, and small irregular cells (the most numerous of all) are the 3 types described. The colloid substance is probably a degenerative product, being most plentiful in pathologic and senile glands. The formation of this substance begins at the periphery, and from there gradually spreads toward the center. In the normal organ but little is found, and this lies in the glandular tubes, not in the blood-vessels and interglandular spaces.

The Minute Structure of the Medullary Sheath of Nerve-fibers.—The supporting framework of the medullary sheath of nerves, as examined by W. H. Wynn² by the Weigert-Pal method, was found to consist of two thin protoplasmic sheaths; one lies central, surrounding the axis-cylinder, the other peripheral, beneath the neurilemma. The cones, whose apexes seem to be perforated by the axis-cylinder, and whose bases have the same diameters as the nerve-fibers, are placed at equal distances apart, and all extend in the same direction in one node, although the direction in different nodes may vary. The longitudinal segments of these cones converge with a slight curve from the primitive sheath to the axis-cylinder, and are highly protoplasmic. The network of neurokeratin usually described and Lantermann's slits are in all probability artificial productions. But very little neurokeratin is found (0.3% to 0.6%), most of the framework being of a protoplasmic nature.

Reissner's Fiber in the Canalis Centralis of Vertebrates.—The occurrence of Reissner's fiber—a free fiber in the canalis centralis first noted by Reissner in 1860—has been studied by P. E. Sargent,³ who concludes that it is an organic structure occurring in all classes of vertebrates. In the different teleosts, which he chiefly studied, this fiber varies greatly in size. Beginning at the termination of the canalis centralis, it ends cephalad at the anterior end of the thalami, and throughout its course gives off fine fibrillæ to the periphery of the central canal, which fibrillæ are most numerous at its caudal end, where the fiber is correspondingly thinner.

MISCELLANEOUS.

The Relation of the Zona Pellucida to the Ovum.—Two statements of recent date, the existence of the perivitelline space and the

¹ Arch. Anat. and Phys., p. 373, 1900.

² Jour. Anat. and Phys., vol. XIV, part III, p. 381.

³ Anat. Anz., Bd. XVII, Nos. 2 and 3, p. 33.

formation of the zona pellucida after the ovum has reached its definite size, are denied by V. v. Ebner.¹ In the experiments of bursting the ova the contents always remained adherent to the zona, which fact can hardly be associated with the existence of a perivitelline space. One of the strong arguments for the presence of this space is the constant position of the germinal spot at the upper pole of the egg, which was accounted for by a supposed rotation of the ovum with its membrane. That the nucleus seeks this pole is in all probability due to its lighter specific gravity. Measurements of ova with zonae of differing thicknesses showed enough of a variance to conclude that the ovum grows when surrounded by its membrane. The zona pellucida increases in thickness by means of the perizonal network of Retzius, which is interposed between it and the cells of the follicle. This network is connected with the inner ends of the follicular cells, and also passes between them. Other processes of these cells pass through the zona to the egg, nourishing the latter, and also serving for the increased extension of the zona during the growth of the egg.

The Position of the Nipple and the Relation of the Heart and Apex to the Left Mammillary Line.—During the examination of 905 healthy recruits from 20 to 22 years of age, A. Kirschner² observed the variable position of the left cardiac boundary. While in about 50 % it coincided with the left mammillary line, in about 25 % each it lay either internal or external to this line. The outward displacement of the apex need not, therefore, be of any pathologic significance, as in such cases it may indicate either a near position of the nipple to the median line, great body-weight, or a shallowness of the inferior portion of the thorax.

Congenital Scoliosis.—Congenital scoliosis, as observed by Mouchet³ in 3 cases, was accounted for by the partial development of a supernumerary vertebra between the first and second lumbar vertebrae. In a case described,—a fetus with numerous other malformations,—only the right half of this vertebra was present as an osseocartilaginous wedge, the other half being totally absent. The articular and transverse processes existed as projections of cartilage; the lamina and spine, however, were of bone; the latter was connected by ligaments with the spine above and below it. The intervertebral discs of this wedge united at its apex between the first and second lumbar vertebrae.

The Relation between Sternum and Conjugata.—Kurz⁴ calls attention to the relation existing between the length of the corpus sterni and pelvic conjugate. From the angulus Ludovici to the angle at the junction of the gladiolus with the xiphoid cartilage were the measurements he employed in living subjects. This inferior point is in a few cases not to be determined with accuracy, and in the cadaver was found to be a little above the junction of these two sternal portions. Among 150 cases cited, in which measurements were conducted on pregnant

¹ Anat. Anz., Bd. XVIII, Nos. 2 and 3, p. 55.

² Anat. Heft, Bd. x, Heft 3.

³ Bull. et Mem. de la Soc. Anat. de Paris, 6 S., vol. 1, p. 972, Nov., 1899.

⁴ Centralbl. f. Gynäk., Nov. 15, 1900.

women, including various forms of pelves, many of them rachitic, a difference of 1 cm. or over was found in 7%. In 93% but a very slight difference could be detected, showing that in the majority of women a definite relation exists between the corpus sterni and conjugata vera.

Anatomic Nomenclature.—One of the most important advances recently made in the new anatomic nomenclature is the appointment of a commission for this purpose by the Association of Anatomists in France. Several text-books recently published have adopted the new terms, so that this movement seems at last to be gradually spreading. Proposals as to improvements have not been lacking. Macalister, for instance, discusses the derivation of the term *tendo Achillis*, whether it was named from the vulnerable spot of this hero, or from the fact that after killing Hector he drew the strap beneath the tendon to drag his corpse around the walls of Troy. If the latter is accepted as the true version, it should more properly be termed the "*tendo Hectoris*." It seems, however, best to retain the term of *tendo calcaneus*. Rose proposes the translating of all technical medical terms, also the anatomic, into Greek, as, for instance, *ecphyasis* for *processus vermiformis*.

A Case of Double Auditory Canal.—An occurrence of a divided right auditory canal by a thin cartilaginous septum, running in an oblique direction from above downward and forward, is reported by L. Guranowsky.¹ Of the two divisions, the anterior terminated blindly, the posterior led to the tympanic membrane. The patient, 29 years of age, had no other malformation of his auditory organ, and stated that the condition had existed since birth.

Pedal Malformations from the Evolutionary Standpoint.—W. H. Hollis² in an amusing way attempts to stretch the evolutionary theory in its application to man. To explain the condition of *talipes valgus* he refers to the most primitive foot, that of the amphibia, in which, by the predominance of the *supinato-extensor* muscles, it is naturally everted. The presence of a supplementary ankle-joint between the two rows of tarsal bones in all amphibia, and the existence of but a single leg bone in some of these, not infrequently occur when this malformation is found in man. *Talipes equinus* is supposed to show a reversion to the *digiti grade carnivora*. The most common distortion, *talipes varus*, represents an arboreal type of foot as especially exemplified in man's near ancestor, the orang-utan. The writer concludes by saying that the rarest malformations are evidences of reversion to the oldest type of foot, and consequently are the rarest to occur.

The Carotid Gland of Mammalia and Its Relation to the Suprarenal Capsule, with Some Remarks upon Internal Secretion and the Phylogeny of the Latter Organ.—S. Vincent³ reconfirms his views with regard to the separate derivation of the medullary and cortical portions of the suprarenal gland: viz., the one from the suprarenal bodies along the sympathetic, and the other from the interrenal bodies of the

¹ Zeit. f. Ohrenh., xxxiv, p. 245.

² Lancet, Oct. 14, 1899.

³ Anat. Anz., vol. xviii, Nos. 2 and 3, pp. 69-76.

elasmobranch fishes. The nervous origin of the medullary portion can be deduced not only along the lines of development, but also histologically from the transition forms between the nerve ganglion cells and the proper medullary cells in the elasmobranchs, amphibians, reptiles, and birds. In the mammalia the medulla is altogether glandular, having a characteristic internal secretion. The writer also suggests that the carotid gland of the mammalia may owe its derivation in a similar way to the suprarenal bodies.

Accessory Thyroid Gland at the Base of the Tongue.—A persistent upper portion of the thyroglossal duct may occasionally give rise to an accessory thyroid gland at the lingual base. A. W. Watson¹ observed two such cases, in which the enlargement of such an anomaly gave rise to a distinct tumor, which had to be removed. Schadle² reports another of these rare cases.

Note on the Presence of Ciliated Cells in the Human Adult Kidney.—The ciliated epithelium of the human kidney is, as in the lower mammals, a normal condition. E. W. Carlier³ describes it as occurring in the spiral and convoluted tubules, both distal and proximal. In the latter the cilia are broad as compared to length, and not very close together. They do not extend into the protoplasm and are distinct from Heidenhain's rods, which are composed of vertical rows of granules connected by fine threads. In the spiral tubules, where Heidenhain's rods are absent, the cytoplasmic granules are irregularly distributed, although they are also joined together. The cilia here measure about $3.1\ \mu$.

The Finer Structure of Cowper's Gland in Man.—The microscopic structure of Cowper's gland leads H. Braus⁴ to believe that it belongs to the mixed alveolotubular type. Numerous muscular fibers of both the striped and unstriped variety surrounded the whole gland, and were also found between its various lobes and within the gland itself. The connective tissue between the smaller lobuli contained numerous yellow elastic fibers, and also, as in other glands, vessels and nerves. The excretory ducts of each lobe bear lacuna-like dilations, of which one lies without and several within the gland, all of which are lined by a single layer of cubic epithelium. Into the dilations within the gland numerous ducts empty. Peripherally these ducts either end blindly or anastomose, by means of very fine channels, with another system of ducts. From the lumina of the end chambers fine secretory capillaries pass between the cells. As a whole, Cowper's gland bears a close resemblance to the mucous glands. Evidences as to its serous character—the crescents of Gianuzzi, which are stated by some to exist in this gland—could not be found.

Upon the Presence of Adrenal Structures in the Inguinal Canal.—Tumor-like masses, apparently lipoma, occasionally occur

¹ N. Y. Med. Jour., Oct. 21, 1899, p. 579.

² Jour. Am. Med. Assoc., Aug. 11, 1899.

³ Jour. Anat. and Phys., vol. XIV, part III, p. 223.

⁴ Anat. Anz., vol. XVII, No. 20, p. 381.

along the course of the inguinal canal, and are sometimes found during the course of an operation, near or upon the hernial sac. Lockwood,¹ from a microscopic study of one of these masses, determined that these tumors are misplaced portions of the adrenal glands, surrounded by a fibrous capsule and fat. Attention has already been called by the writers to the fact that these glands in the embryo are more extensive than is usually supposed. They may at this time of life reach the hilum of the kidney, and even accompany the ureter to the testicle or ovary. Monstrosities which occur between the rectum and bladder may possibly have their origin in portions of these organs.

The Development of Double Urethra.—Low² reports a case of double urethra (congenital dorsal penile fistula) which he observed in a patient, treating for urethritis. Two openings, one above the other, separated by a mucosa-like septum, were apparent at the external urethral orifice, from both of which a gonorrheal discharge flowed freely. From the injection of colored liquids, endoscopic examinations, and the passage of sounds he concluded that the upper channel communicated with the underlying urethra at but one point at the prostatic portion. After giving a short review of similar cases so far recorded, and the different theories advanced for the origin of this anomaly, he himself says a few words concerning its development. The mesodermal urethral sulcus is, as he believes, at one time completely filled with ectodermal cells, the partial absorption of which gives rise to the lumen of the urethra. The formation of several such lumina in this epithelial column probably accounts for the occasional occurrence of these congenital dorsal penile fistulæ.

¹ Jour. Anat. and Phys., vol. XIV, part 1, p. 79.

² Wien. med. Woch., No. 28, 1900.

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An American Text-Book of Diseases of Children,	1
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Meigs —Feeding in Early Infancy,	10
Powell —Essentials of Diseases of Children,	15
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The American Illustrated Medical Dictionary ,	3
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Morten —Nurses' Dictionary,	10

EYE, EAR, NOSE, AND THROAT.

An American Text-Book of Diseases of the Eye, Ear, Nose, and Throat,	1
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Grünwald and Grayson —Atlas of Diseases of the Larynx,	16
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Jackson and Gleason —Essentials of Diseases of the Eye, Nose, and Throat,	15
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GENITO-URINARY.

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NERVOUS AND MENTAL DISEASES, ETC.

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Church and Peterson—Nervous and Mental Diseases,	5
Shaw—Essentials of Nervous Diseases and Insanity,	15

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SKIN AND VENEREAL.

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Hyde and Montgomery—Syphilis and the Venereal Diseases,	8
Martin—Essentials of Minor Surgery, Bandaging, and Venereal Diseases,	15
Mracek and Stelwagon—Atlas of Diseases of the Skin,	16
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SURGERY.

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